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THE

AMERICAN EPHEMERIS

AND

NAUTICAL ALMANAC

FOR THE YEAR

1887

FIRST EDITION

PUBLISHED IN COMPLIANCE WITH A JOINT RESOLUTION OF THE FORTY-SIXTH CONGRESS

WASHINGTON:
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1884.

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JOINT RESOLUTION

FOR PRINTING THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That there shall be printed annually at the Government Printing Office fifteen hundred copies of the American Ephemeris and Nautical Almanac and of the papers supplementary thereto, of which one hundred shall be for the use of the Senate, four hundred for the House of Representatives, and one thousand for the public service, to be distributed by the Navy Department.

Sec. 2 *That additional copies of the Ephemeris and of the Nautical Almanac extracted therefrom may be ordered by the Secretary of the Navy for sale: Provided, That all moneys received from such sale shall be deposited in the Treasury to the credit of the appropriation for public printing.*

Approved, February 11, 1880.

PREFACE.

THE contents of the present volume of *The American Ephemeris* are, in general, similar to those of the volume for the preceding year. Beginning with the volume for the year 1882, the arrangement of the work is as follows:—

Part I, *Ephemeris for the Meridian of Greenwich*, gives the positions of the major planets, and other fundamental astronomical data for equidistant intervals of Greenwich mean time.

Part II, *Ephemeris for the Meridian of Washington*, gives the ephemerides of the fixed stars, sun, moon, and major planets for transit over the meridian of Washington. The mean places of the fixed stars and data for their reduction are also included in this Part. The list of mean and apparent places of fixed stars has been greatly enlarged, for the convenience of field-astronomers.

Part III, *Phenomena*, contains predictions of phenomena to be observed, with data for their computation. Washington mean time is used in this part except in a few cases, notably that of eclipses, where Greenwich mean time was judged more convenient. The additions comprise more complete data for eclipses of the sun, diagrams showing the configurations of the satellites of Jupiter, data respecting the disks of Mercury and Venus for the reduction of meridian and photometric observations, and diagrams, with tables, for identifying any known satellites of other planets.

SIMON NEWCOMB,

Professor U. S. Navy, Superintendent

WASHINGTON, *February*, 1884.

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CORRECTIONS.

Ephemeris for 1884 (*First Edition*).

Page 293,	σ Andromedæ,	Declination,	*for* $+35°$	*read* $+36°$
294,	σ Arietis,	Ann. Var. R. A.,	" $+3^s.3057$	" $+3^s.3036$
295,	ζ Geminorum,	Right Ascension,	" $14^s.108$	" $13^s.747$
	Annual variation in	Right Ascension,	" $+3.6527$	" $+3.5627$
297,	ξ Hydræ,	Declination,	" $37''.64$	" $57''.64$
315,	α Cassiopeæ,	Dec. 34.2, Declination,	" $88''.9$	" $98''.9$
339,	η Bootis,	Dec. 34.8, R. A.,	" $11^s.24$	" $12^s.24$

Ephemeris for 1885 (*First Edition*).

Page 249, last line in last column, *for* 8 30.7 *read* 8 30.8

325, 22 Camelop. (H.), R. A. opposite Oct. 5.7, " .74 " .76

Delete – .07 opposite Dec. 34.5 and move column from Oct. 5.7, inclusive, down one line.

375, fifth column, *for* o¹ Cygni *read* 31 Cygni

408—409, Declination of Neptune from Sept. 1 to Dec. 32, both included, to be increased *one* degree.

417, Third column, second line, remove E to third line.

453, Diagram of Jupiter's Satellites, reverse direction of arrows.

482, In first column, *for* Mar. $19^d\ 8^h$ *read* Mar. $19^d\ 18^h$.

The American Nautical Almanac for 1886 (*First Edition*).

Page 253, Eclipse Charts, first line, *for* August 8—9 *read* August 28—9.

261, Twenty-third line, " $21^h\ 5^m\ 57^s.4$ " $21^h\ 6^m\ 55^s.06$

The American Ephemeris and Nautical Almanac for 1886 (*First Edition*).

Page 113, July 5, Moon's Upper Transit, *for* $2^h\ 32^m.8$ *read* $3^h\ 32^m.8$

200, Dec. 22, Equation of Time, " $0^m\ 8^s.54$ " $1^m\ 8^s.54$

263, To the heliocentric longitude of Neptune apply the following corrections:
Jan. 3, $-0''.80$; Mar. 8, $-0''.96$; May 3, $-1''.12$; July 6, $-1''.30$; Sept. 8, $-1''.48$; Nov. 3, $-1''.62$; Dec. 37, $-1''.80$, and interpolated values for intermediate dates.

249, 409 and 410, To the apparent R. A. and Dec. of Neptune apply the following corrections:

	R. A.	Dec.
	s	"
Jan. 3,	— 0.05	— 0.2
April 9,	— 0.05	— 0.2
Aug. 15,	— 0.10	— 0.3
Dec. 21,	— 0.11	— 0.5

and interpolated values for intermediate dates.

276, From Nov. 16 to Dec. 36, increase ☊′ by 1′.

482, Under "Washington Mean Times of Elongations," *for* Titania *read* Ariel and *for* Ariel *read* Titania.

504, Lines 5, 8 and 9 from top, *for* sin φ' *read* cos φ'

516, Line 8, " 1885.0 " 1886.0

517, Line 30, " adapted " adopted.

CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

THE YEAR 1887, WHICH COMPRISES THE LATTER PART OF THE 111TH AND THE BEGINNING OF THE 112TH YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO—

The year 6600 of the Julian Period;
" 7395–96 of the Byzantine era, the year 7396 commencing on September 1st;
" 5647–48 of the Jewish era, the year 5648 commencing on September 19th, or, more exactly, at sunset on September 18th;
" 2640 since the foundation of Rome, according to Varro;
" 2634 since the beginning of the era of Nabonassar, which has been assigned to Wednesday, the 26th of February of the 3967th year of the Julian Period: corresponding, in the notation of chronologists, to the 747th; and, in the notation of astronomers, to the 746th year before the birth of Christ;
" 2663 of the Olympiads, or the third year of the 666th Olympiad commencing in July, 1887, if we fix the era of the Olympiads at 775½ years before Christ, or near the beginning of July of the year 3938 of the Julian Period;
" 2199 of the Grecian era, or the era of the Seleucidæ;
" 1603 of the era of Diocletian;
" 2547 of the Japanese era and to the 20th year of the period entitled "Meiji."

The year 1305 of the Mohammedan era, or the era of the Hegira, begins on the 19th day of September, 1887.

The first day of January of the year 1887 is the 2,410,273d day since the commencement of the Julian Period.

CHRONOLOGICAL CYCLES.

Dominical Letter	B	Solar Cycle	20
Epact	6	Roman Indiction	15
Lunar Cycle or Golden Number	7	Julian Period	6600

SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, ETC.

☉	The Sun.	♂	Mars.
☾	The Moon.	♃	Jupiter.
☿	Mercury.	♄	Saturn.
♀	Venus.	♅	Uranus.
⊕	The Earth.	♆	Neptune.

SIGNS OF THE ZODIAC.

Spring Signs.	1.	♈	Aries.	Autumn Signs.	7.	♎	Libra.
	2.	♉	Taurus.		8.	♏	Scorpius.
	3.	♊	Gemini.		9.	♐	Sagittarius
Summer Signs.	4.	♋	Cancer.	Winter Signs.	10.	♑	Capricornus.
	5.	♌	Leo.		11.	♒	Aquarius.
	6.	♍	Virgo.		12.	♓	Pisces.

ASPECTS.

☌	Conjunction, or having the same Longitude or Right Ascension.
□	Quadrature, or differing 90° in Longitude or Right Ascension.
☍	Opposition, or differing 180° in Longitude or Right Ascension.

ABBREVIATIONS.

☊	Ascending Node.	$^{\circ}$	Degrees.
☋	Descending Node.	$'$	Minutes of Arc.
N.	North.	$''$	Seconds of Arc.
S.	South.	^{h}	Hours.
E.	East.	^{m}	Minutes of Time.
W.	West.	^{s}	Seconds of Time.

PART I.

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF GREENWICH.

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sat.	1	18 47 4.34	11.043	S. 23 0 37.7	+12.41	16 18.36	71.08	3 46.72	1.182
SUN.	2	18 51 29.18	11.026	22 55 26.2	13.55	16 18.36	71.03	4 14.91	1.167
Mon.	3	18 55 53.64	11.009	22 49 47.3	14.69	16 18.36	70.98	4 42.73	1.150
Tues.	4	19 0 17.69	10.992	22 43 41.1	+15.82	16 18.36	70.93	5 10.14	1.133
Wed.	5	19 4 41.30	10.973	22 37 7 9	16.94	16 18.35	70.87	5 37.12	1.114
Thur.	6	19 9 4.45	10.954	22 30 7.7	18.06	16 18.33	70.81	6 3.65	1.095
Frid.	7	19 13 27.12	10.933	22 22 41.0	+19.16	16 18.30	70.75	6 29.68	1.074
Sat.	8	19 17 49.27	10.912	22 14 47.8	20.26	16 18.27	70.68	6 55.21	1.053
SUN.	9	19 22 10.89	10.889	22 6 28.4	21.34	16 18.23	70.61	7 20.21	1.030
Mon.	10	19 26 31.96	10.866	21 57 43.1	+22.42	16 18.19	70.53	7 44.66	1.007
Tues.	11	19 30 52.47	10.842	21 48 32.1	23.48	16 18.14	70.45	8 8.54	0.983
Wed.	12	19 35 12.39	10.818	21 38 55.6	24.54	16 18.09	70.37	8 31.85	0.959
Thur.	13	19 39 31.70	10.792	21 28 53.9	+25.58	16 18.03	70.28	8 54.54	0.933
Frid.	14	19 43 50.38	10.766	21 18 27.4	26.61	16 17.96	70.19	9 16.60	0.907
Sat.	15	19 48 8.42	10.739	21 7 36.3	27.63	16 17.89	70.10	9 38.02	0.880
SUN.	16	19 52 25.81	10.710	20 56 20.9	+28.64	16 17.81	70.01	9 58.80	0.852
Mon.	17	19 56 42.52	10.681	20 44 41.5	29 63	16 17.73	69.91	10 18.90	0.823
Tues.	18	20 0 58.53	10.652	20 32 38.5	30.61	16 17.64	69.81	10 38.30	0.794
Wed.	19	20 5 13.83	10.622	20 20 12.2	+31.57	16 17.55	69.71	10 56.99	0.764
Thur.	20	20 9 28.41	10.592	20 7 22.8	32.52	16 17.45	69.60	11 14.97	0.734
Frid.	21	20 13 42.25	10.561	19 54 10.8	33.45	16 17.35	69.50	11 32.21	0.703
Sat.	22	20 17 55.33	10.529	19 40 36.6	+34.38	16 17.25	69.39	11 48.69	0.671
SUN.	23	20 22 7.64	10.497	19 26 40.5	35.29	16 17.14	69.28	12 4.40	0.639
Mon.	24	20 26 19.17	10.461	19 12 22.8	36.18	16 17.03	69.17	12 19.32	0.606
Tues.	25	20 30 29.90	10.430	18 57 43.9	+37.04	16 16.92	69.06	12 33.46	0.573
Wed.	26	20 34 39.83	10.396	18 42 44.4	37.90	16 16.80	68.95	12 46.80	0.539
Thur.	27	20 38 48.94	10.362	18 27 24.5	38.74	16 16.68	68.84	12 59.32	0.505
Frid.	28	20 42 57.21	10.327	18 11 44.5	+39.57	16 16.55	68.73	13 11.00	0.470
Sat.	29	20 47 4.64	10.292	17 55 44.9	40.38	16 16.42	68.62	13 21.84	0.435
SUN.	30	20 51 11.24	10.257	17 39 26.2	41.18	16 16.29	68.50	13 31.86	0.400
Mon.	31	20 55 17.00	10.222	17 22 48.8	41.95	16 16.16	68.39	13 41.04	0.365
Tues.	32	20 59 21.91	10.187	S. 17 5 53.1	+42.70	16 16.02	68.27	13 49.37	0.330

Note.—The mean time of semidiameter passing may be found by subtracting 0s.19 from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Sat.	1	18 47 3.65	11.039	S. 23 0 38.5	+12.40	3 46.64	1.182	18 43 17.01
SUN.	2	18 51 28.40	11.023	22 55 27.1	13.54	4 14.83	1.167	18 47 13.57
Mon.	3	18 55 52.77	11.006	22 49 48.4	14.68	4 42.64	1.150	18 51 10.13
Tues.	4	19 0 16.74	10.989	22 43 42.4	+15.81	5 10.05	1.133	18 55 6.69
Wed.	5	19 4 40.27	10.970	22 37 9.4	16.93	5 37.02	1.114	18 59 3.25
Thur.	6	19 9 3.34	10.951	22 30 9.5	18.05	6 3.54	1.095	19 2 59.80
Frid.	7	19 13 25.93	10.930	22 22 43.0	+19.15	6 29.57	1.074	19 6 56.36
Sat.	8	19 17 48.01	10.909	22 14 50.1	20.25	6 55.09	1.053	19 10 52.92
SUN.	9	19 22 9.56	10.886	22 6 31.0	21.33	7 20.08	1.030	19 14 49.48
Mon.	10	19 26 30.56	10.863	21 57 46.0	+22.41	7 44.53	1.007	19 18 46.03
Tues.	11	19 30 51.00	10.839	21 48 35.3	23.47	8 8.41	0.983	19 22 42.59
Wed.	12	19 35 10.85	10.815	21 38 59.1	24.53	8 31.71	0.959	19 26 39.14
Thur.	13	19 39 30.10	10.789	21 28 57.7	+25.57	8 54.40	0.933	19 30 35.70
Frid.	14	19 43 48.72	10.763	21 18 31.5	26.60	9 16.46	0.907	19 34 32.26
Sat.	15	19 48 6.70	10.736	21 7 40.7	27.62	9 37.88	0.880	19 38 28.82
SUN.	16	19 52 24.03	10.708	20 56 25.6	+28.63	9 58.66	0.852	19 42 25.37
Mon.	17	19 56 40.68	10.679	20 44 46.6	29.62	10 18.76	0.823	19 46 21.93
Tues.	18	20 0 56.64	10.650	20 32 43.9	30.60	10 38.16	0.794	19 50 18.48
Wed.	19	20 5 11.89	10.620	20 20 17.9	+31.56	10 56.85	0.764	19 54 15.04
Thur.	20	20 9 26.42	10.590	20 7 28.9	32.51	11 14.83	0.734	19 58 11.59
Frid.	21	20 13 40.22	10.559	19 54 17.2	33.44	11 32.07	0.703	20 2 8.15
Sat.	22	20 17 53.26	10.527	19 40 43.3	+34.37	11 48.56	0.671	20 6 4.70
SUN.	23	20 22 5.53	10.495	19 26 47.5	35.28	12 4.27	0.639	20 10 1.26
Mon.	24	20 26 17.02	10.462	19 12 30.1	36.17	12 19.20	0.606	20 13 57.82
Tues.	25	20 30 27.72	10.429	18 57 51.6	+37.03	12 33.34	0.573	20 17 54.38
Wed.	26	20 34 37.62	10.395	18 42 52.4	37.89	12 46.69	0.539	20 21 50.93
Thur.	27	20 38 46.70	10.361	18 27 32.8	38.73	12 59.21	0.505	20 25 47.49
Frid.	28	20 42 54.94	10.326	18 11 53.1	+39.56	13 10.90	0.470	20 29 44.04
Sat.	29	20 47 2.35	10.291	17 55 53.9	40.37	13 21.75	0.435	20 33 40.60
SUN.	30	20 51 8.93	10.256	17 39 35.5	41.17	13 31.78	0.400	20 37 37.15
Mon.	31	20 55 14.67	10.221	17 22 58.4	41.94	13 40.96	0.365	20 41 33.71
Tues.	32	20 59 19.56	10.186	S. 17 6 2.9	+42.69	13 49.30	0.330	20 45 30.26

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour, $+9^s.8565$. (Table III.)

Day of the Month.	Day of the Year.	AT GREENWICH MEAN NOON.						Mean Time of Sidereal Noon.
		THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	1	280 49 23.0	49 31.1	152.91	− 0.36	9.9926751	− 1.3	5 15 51.09
2	2	281 50 32.7	50 40.6	152.90	0.47	9.9926731	− 0.4	5 11 55.19
3	3	282 51 42.0	51 49.7	152.88	0.56	9.9926734	+ 0.6	5 7 59.28
4	4	283 52 50.9	52 58.5	152.86	− 0.63	9.9926761	+ 1.7	5 4 3.36
5	5	284 53 59.5	54 6.9	152.84	0.67	9.9926814	2.7	5 0 7.45
6	6	285 55 7.7	55 14.9	152.83	0.67	9.9926893	3.8	4 56 11.54
7	7	286 56 15.5	56 22.5	152.81	− 0.64	9.9926999	+ 5.0	4 52 15.63
8	8	287 57 23.0	57 29.8	152.80	0.58	9.9927134	6.2	4 48 19.72
9	9	288 58 30.2	58 36.9	152.79	0.50	9.9927297	7.3	4 44 23.82
10	10	289 59 37.0	59 43.6	152.78	− 0.40	9.9927488	+ 8.5	4 40 27.91
11	11	291 0 43.5	0 49.9	152.77	0.28	9.9927708	9.7	4 36 32.00
12	12	292 1 49.8	1 56.0	152.76	0.15	9.9927955	10.8	4 32 36.08
13	13	293 2 55.9	3 1.9	152.75	− 0.02	9.9928228	+ 11.9	4 28 40.17
14	14	294 4 1.7	4 7.6	152.74	+ 0.10	9.9928527	13.0	4 24 44.26
15	15	295 5 7.3	5 13.1	152.73	0.21	9.9928852	14.1	4 20 48.35
16	16	296 6 12.7	6 18.3	152.72	+ 0.30	9.9929202	+ 15.1	4 16 52.43
17	17	297 7 17.9	7 23.3	152.71	0.37	9.9929575	16.0	4 12 56.52
18	18	298 8 22.7	8 28.0	152.69	0.41	9.9929968	16.8	4 9 0.61
19	19	299 9 27.1	9 32.3	152.68	+ 0.42	9.9930380	+ 17.6	4 5 4.70
20	20	300 10 31.1	10 36.2	152.66	0.40	9.9930810	18.3	4 1 8.79
21	21	301 11 34.6	11 39.5	152.64	0.36	9.9931258	19.0	3 57 12.88
22	22	302 12 37.6	12 42.3	152.61	+ 0.28	9.9931722	+ 19.7	3 53 16.97
23	23	303 13 39.9	13 44.5	152.58	0.18	9.9932201	20.3	3 49 21.06
24	24	304 14 41.5	14 46.0	152.55	+ 0.06	9.9932694	20.9	3 45 25.15
25	25	305 15 42.2	15 46.6	152.51	− 0.07	9.9933202	+ 21.5	3 41 29.23
26	26	306 16 42.0	16 46.2	152.47	0.21	9.9933725	22.1	3 37 33.32
27	27	307 17 40.7	17 44.8	152.43	0.35	9.9934263	22.7	3 33 37.41
28	28	308 18 38.3	18 42.3	152.38	− 0.48	9.9934816	+ 23.4	3 29 41.51
29	29	309 19 34.6	19 38.5	152.32	0.59	9.9935385	24.1	3 25 45.59
30	30	310 20 29.6	20 33.4	152.26	0.68	9.9935971	24.8	3 21 49.68
31	31	311 21 23.3	21 26.9	152.21	0.74	9.9936574	25.5	3 17 53.78
32	32	312 22 15.6	22 19.0	152.15	− 0.77	9.9937196	+ 26.3	3 13 57.88

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, $-9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 48.9	14 50.6	54 15.3	+0.42	54 21.7	+0.64	5 29.6	1.75	7.1
2	14 53.1	14 56.2	54 30.7	0.86	54 42.3	1.08	6 11.9	1.78	8.1
3	15 0.1	15 4.6	54 56.5	1.28	55 13.0	1.47	6 55.2	1.84	9.1
4	15 9.7	15 15.4	55 31.8	+1.65	55 52.6	+1.80	7 40.3	1.93	10.1
5	15 21.5	15 28.0	56 15.1	1.93	56 39.0	2.03	8 28.1	2.06	11.1
6	15 34.8	15 41.7	57 3.9	2.09	57 29.2	2.11	9 19.0	2.20	12.1
7	15 48.6	15 55.3	57 54.5	+2.09	58 19.3	+2.02	10 13.3	2.33	13.1
8	16 1.8	16 7.8	58 43.0	1.91	59 5.0	1.74	11 10.5	2.43	14.1
9	16 13.2	16 17.8	59 24.8	1.54	59 41.9	1.30	12 9.4	2.47	15.1
10	16 21.6	16 24.6	59 56.0	+1.03	60 6.7	+0.74	13 8.7	2.45	16.1
11	16 26.5	16 27.5	60 13.8	+0.45	60 17.4	+0.15	14 6.9	2.39	17.1
12	16 27.5	16 26.6	60 17.4	−0.14	60 14.1	−0.40	15 3.1	2.30	18.1
13	16 24.8	16 22.4	60 7.7	−0.64	59 58.7	−0.85	15 57.3	2.22	19.1
14	16 19.3	16 15.7	59 47.3	1.03	59 34.0	1.17	16 49.7	2.15	20.1
15	16 11.6	16 7.3	59 19.2	1.28	59 3.3	1.36	17 41.0	2.12	21.1
16	16 2.8	15 58.1	58 46.6	−1.41	58 29.5	−1.43	18 31.8	2.12	22.1
17	15 53.4	15 48.7	58 12.3	1.43	57 55.1	1.43	19 22.7	2.13	23.1
18	15 44.1	15 39.6	57 38.1	1.41	57 21.4	1.38	20 14.1	2.15	24.1
19	15 35.1	15 30.8	57 5.1	−1.34	56 49.2	−1.31	21 6.0	2.17	25.1
20	15 26.6	15 22.5	56 33.8	1.27	56 18.8	1.23	21 57.9	2.16	26.1
21	15 18.6	15 14.8	56 4.3	1.19	55 50.3	1.15	22 49.4	2.13	27.1
22	15 11.1	15 7.5	55 36.8	−1.11	55 23.8	−1.06	23 39.8	2.06	28.1
23	15 4.2	15 1.0	55 11.4	1.01	54 59.7	0.95	δ		29.1
24	14 58.0	14 55.2	54 48.7	0.88	54 38.5	0.81	0 28.5	1.99	0.4
25	14 52.7	14 50.5	54 29.3	−0.72	54 21.2	−0.62	1 15.3	1.91	1.4
26	14 48.6	14 47.2	54 14.4	0.51	54 9.0	0.38	2 0.2	1.84	2.4
27	14 46.1	14 45.6	54 5.2	−0.24	54 3.1	−0.09	2 43.5	1.78	3.4
28	14 45.5	14 46.1	54 3.0	+0.08	54 4.9	+0.25	3 25.8	1.75	4.4
29	14 47.2	14 48.9	54 9.0	0.44	54 15.4	0.63	4 7.7	1.75	5.4
30	14 51.3	14 54.4	54 24.2	0.84	54 35.5	1.05	4 50.0	1.78	6.4
31	14 58.1	15 2.6	54 49.3	1.26	55 5.6	1.46	5 33.5	1.85	7.4
32	15 7.7	15 13.4	55 24.3	+1.66	55 45.3	+1.84	6 18.8	1.94	8.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 3 29.51	1.8676	S. 2 29 47.7	9.656
1	0 5 21.56	1.8676	2 20 8.0	9.667
2	0 7 13.62	1.8677	2 10 27.7	9.677
3	0 9 5.68	1.8677	2 0 46.7	9.688
4	0 10 57.74	1.8678	1 51 5.1	9.698
5	0 12 49.82	1.8681	1 41 22.9	9.708
6	0 14 41.91	1.8683	1 31 40.1	9.717
7	0 16 34.01	1.8686	1 21 56.8	9.726
8	0 18 26.14	1.8690	1 12 13.0	9.734
9	0 20 18.29	1.8693	1 2 28.7	9.742
10	0 22 10.46	1.8697	0 52 43.9	9.749
11	0 24 2.66	1.8703	0 42 58.8	9.755
12	0 25 54.90	1.8709	0 33 13.3	9.761
13	0 27 47.17	1.8715	0 23 27.5	9.767
14	0 29 39.48	1.8722	0 13 41.3	9.772
15	0 31 31.84	1.8730	S. 0 3 54.8	9.777
16	0 33 24.24	1.8738	N. 0 5 51.9	9.781
17	0 35 16.69	1.8746	0 15 38.9	9.785
18	0 37 9.19	1.8755	0 25 26.1	9.788
19	0 39 1.75	1.8765	0 35 13.4	9.790
20	0 40 54.37	1.8774	0 45 0.9	9.792
21	0 42 47.04	1.8784	0 54 48.5	9.793
22	0 44 39.78	1.8796	1 4 36.1	9.794
23	0 46 32.59	1.8808	N. 1 14 23.8	9.794

SUNDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 48 25.48	1.8821	N. 1 24 11.4	9.793
1	0 50 18.44	1.8833	1 33 59.0	9.793
2	0 52 11.48	1.8846	1 43 46.5	9.792
3	0 54 4.59	1.8859	1 53 34.0	9.790
4	0 55 57.79	1.8874	2 3 21.3	9.788
5	0 57 51.08	1.8890	2 13 8.5	9.785
6	0 59 44.47	1.8906	2 22 55.5	9.781
7	1 1 37.95	1.8922	2 32 42.2	9.777
8	1 3 31.53	1.8938	2 42 28.7	9.772
9	1 5 25.20	1.8954	2 52 14.9	9.767
10	1 7 18.98	1.8972	3 2 0.7	9.761
11	1 9 12.87	1.8991	3 11 46.2	9.755
12	1 11 6.87	1.9010	3 21 31.3	9.748
13	1 13 0.99	1.9030	3 31 15.9	9.740
14	1 14 55.23	1.9050	3 41 0.1	9.732
15	1 16 49.59	1.9070	3 50 43.8	9.723
16	1 18 44.07	1.9090	4 0 26.9	9.713
17	1 20 38.67	1.9111	4 10 9.4	9.704
18	1 22 33.40	1.9133	4 19 51.4	9.694
19	1 24 28.27	1.9156	4 29 32.7	9.683
20	1 26 23.28	1.9180	4 39 13.3	9.671
21	1 28 18.43	1.9203	4 48 53.2	9.659
22	1 30 13.72	1.9228	4 58 32.4	9.646
23	1 32 9.16	1.9253	5 8 10.8	9.632
24	1 34 4.76	1.9278	N. 5 17 48.3	9.618

MONDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 34 4.76	1.9278	N. 5 17 48.3	9.618
1	1 36 0.51	1.9304	5 27 25.0	9.603
2	1 37 56.41	1.9330	5 37 0.7	9.588
3	1 39 52.47	1.9358	5 46 35.5	9.572
4	1 41 48.70	1.9386	5 56 9.3	9.555
5	1 43 45.10	1.9414	6 5 42.1	9.537
6	1 45 41.66	1.9442	6 15 13.8	9.519
7	1 47 38.40	1.9471	6 24 44.4	9.501
8	1 49 35.31	1.9500	6 34 13.9	9.482
9	1 51 32.40	1.9530	6 43 42.2	9.461
10	1 53 29.67	1.9561	6 53 9.2	9.440
11	1 55 27.13	1.9593	7 2 35.0	9.419
12	1 57 24.78	1.9625	7 11 59.5	9.397
13	1 59 22.62	1.9657	7 21 22.6	9.374
14	2 1 20.66	1.9689	7 30 44.4	9.351
15	2 3 18.89	1.9722	7 40 4.8	9.327
16	2 5 17.32	1.9756	7 49 23.7	9.302
17	2 7 15.96	1.9790	7 58 41.0	9.276
18	2 9 14.80	1.9825	8 7 56.8	9.250
19	2 11 13.86	1.9861	8 17 11.0	9.223
20	2 13 13.13	1.9896	8 26 23.6	9.196
21	2 15 12.61	1.9932	8 35 34.5	9.167
22	2 17 12.31	1.9969	8 44 43.6	9.137
23	2 19 12.24	2.0007	N. 8 53 50.9	9.107

TUESDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	2 21 12.39	2.0044	N. 9 2 56.4	9.077
1	2 23 12.77	2.0082	9 12 0.1	9.045
2	2 25 13.38	2.0121	9 21 1.8	9.013
3	2 27 14.22	2.0160	9 30 1.6	8.980
4	2 29 15.30	2.0200	9 38 59.4	8.946
5	2 31 16.62	2.0240	9 47 55.1	8.911
6	2 33 18.18	2.0281	9 56 48.7	8.876
7	2 35 19.99	2.0322	10 5 40.2	8.840
8	2 37 22.04	2.0363	10 14 29.5	8.802
9	2 39 24.34	2.0404	10 23 16.5	8.764
10	2 41 26.89	2.0447	10 32 1.2	8.726
11	2 43 29.70	2.0490	10 40 43.6	8.687
12	2 45 32.77	2.0533	10 49 23.6	8.647
13	2 47 36.10	2.0577	10 58 1.2	8.605
14	2 49 39.69	2.0620	11 6 36.2	8.563
15	2 51 43.54	2.0664	11 15 8.7	8.520
16	2 53 47.66	2.0710	11 23 38.6	8.476
17	2 55 52.06	2.0756	11 32 5.8	8.432
18	2 57 56.73	2.0801	11 40 30.4	8.387
19	3 0 1.67	2.0847	11 48 52.2	8.340
20	3 2 6.89	2.0893	11 57 11.2	8.292
21	3 4 12.39	2.0940	12 5 27.3	8.244
22	3 6 18.17	2.0987	12 13 40.5	8.195
23	3 8 24.23	2.1033	12 21 50.7	8.145
24	3 10 30.57	2.1081	N.12 29 57.9	8.094

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 5.					**FRIDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 10 30.57	2.1081	N.12 29 57.9	8.094	0	4 57 35.24	2.3552	N.17 41 27.4	4.498
1	3 12 37.20	2.1129	12 38 2.0	8.042	1	4 59 56.70	2.3602	17 45 54.3	4.398
2	3 14 44.12	2.1178	12 46 3.0	7.990	2	5 2 18.46	2.3652	17 50 15.2	4.298
3	3 16 51.33	2.1227	12 54 0.8	7.936	3	5 4 40.52	2.3701	17 54 30.1	4.197
4	3 18 58.84	2.1276	13 1 55.3	7.882	4	5 7 2.87	2.3749	17 58 38.8	4.094
5	3 21 6.64	2.1325	13 9 46.6	7.827	5	5 9 25.50	2.3796	18 2 41.4	3.991
6	3 23 14.74	2.1375	13 17 34.5	7.770	6	5 11 48.42	2.3844	18 6 37.8	3.887
7	3 25 23.14	2.1425	13 25 19.0	7.712	7	5 14 11.63	2.3892	18 10 27.9	3.782
8	3 27 31.84	2.1474	13 33 0.0	7.654	8	5 16 35.12	2.3938	18 14 11.6	3.675
9	3 29 40.83	2.1524	13 40 37.5	7.595	9	5 18 58.89	2.3985	18 17 48.9	3.568
10	3 31 50.13	2.1575	13 48 11.4	7.534	10	5 21 22.94	2.4031	18 21 19.8	3.461
11	3 33 59.73	2.1626	13 55 41.6	7.472	11	5 23 47.26	2.4077	18 24 44.2	3.352
12	3 36 9.64	2.1677	14 3 8.1	7.410	12	5 26 11.86	2.4122	18 28 2.0	3.242
13	3 38 19.86	2.1728	14 10 30.8	7.347	13	5 28 36.73	2.4166	18 31 13.2	3.131
14	3 40 30.38	2.1779	14 17 49.8	7.284	14	5 31 1.85	2.4209	18 34 17.7	3.019
15	3 42 41.21	2.1831	14 25 4.9	7.219	15	5 33 27.23	2.4252	18 37 15.5	2.907
16	3 44 52.35	2.1883	14 32 16.1	7.152	16	5 35 52.87	2.4295	18 40 6.6	2.794
17	3 47 3.81	2.1936	14 39 23.2	7.084	17	5 38 18.77	2.4337	18 42 50.8	2.680
18	3 49 15.58	2.1988	14 46 26.2	7.016	18	5 40 44.92	2.4378	18 45 28.2	2.566
19	3 51 27.66	2.2040	14 53 25.1	6.947	19	5 43 11.31	2.4419	18 47 58.7	2.450
20	3 53 40.06	2.2092	15 0 19.9	6.877	20	5 45 37.95	2.4460	18 50 22.2	2.334
21	3 55 52.77	2.2145	15 7 10.4	6.806	21	5 48 4.83	2.4499	18 52 38.7	2.217
22	3 58 5.80	2.2197	15 13 56.6	6.734	22	5 50 31.94	2.4538	18 54 48.2	2.099
23	4 0 19.14	2.2250	N.15 20 38.5	6.661	23	5 52 59.29	2.4576	N.18 56 50.6	1.981
	THURSDAY 6.					**SATURDAY 8.**			
0	4 2 32.80	2.2303	N.15 27 15.9	6.586	0	5 55 26.86	2.4613	N.18 58 45.9	1.862
1	4 4 46.78	2.2356	15 33 48.8	6.511	1	5 57 54.65	2.4650	19 0 34.0	1.742
2	4 7 1.07	2.2408	15 40 17.2	6.435	2	6 0 22.66	2.4686	19 2 14.9	1.621
3	4 9 15.68	2.2462	15 46 41.0	6.357	3	6 2 50.89	2.4721	19 3 48.5	1.499
4	4 11 30.61	2.2515	15 53 0.1	6.279	4	6 5 19.32	2.4755	19 5 14.8	1.378
5	4 13 45.86	2.2568	15 59 14.5	6.200	5	6 7 47.95	2.4789	19 6 33.8	1.256
6	4 16 1.42	2.2620	16 5 24.1	6.119	6	6 10 16.79	2.4823	19 7 45.5	1.133
7	4 18 17.30	2.2673	16 11 28.8	6.038	7	6 12 45.83	2.4855	19 8 49.8	1.009
8	4 20 33.50	2.2726	16 17 28.6	5.956	8	6 15 15.05	2.4885	19 9 46.6	0.884
9	4 22 50.01	2.2779	16 23 23.5	5.873	9	6 17 44.45	2.4915	19 10 35.9	0.759
10	4 25 6.84	2.2832	16 29 13.4	5.788	10	6 20 14.03	2.4945	19 11 17.7	0.634
11	4 27 23.99	2.2884	16 34 58.1	5.702	11	6 22 43.79	2.4974	19 11 52.0	0.509
12	4 29 41.45	2.2937	16 40 37.6	5.615	12	6 25 13.72	2.5002	19 12 18.8	0.383
13	4 31 59.23	2.2989	16 46 11.9	5.528	13	6 27 43.82	2.5029	19 12 38.0	0.256
14	4 34 17.32	2.3041	16 51 41.0	5.440	14	6 30 14.07	2.5055	19 12 49.6	0.129
15	4 36 35.72	2.3093	16 57 4.7	5.350	15	6 32 44.48	2.5081	19 12 53.5	+0.002
16	4 38 54.44	2.3146	17 2 23.0	5.259	16	6 35 15.04	2.5105	19 12 49.8	−0.126
17	4 41 13.47	2.3197	17 7 35.8	5.168	17	6 37 45.74	2.5128	19 12 38.4	0.254
18	4 43 32.80	2.3248	17 12 43.1	5.076	18	6 40 16.57	2.5150	19 12 19.3	0.383
19	4 45 52.44	2.3299	17 17 44.8	4.981	19	6 42 47.54	2.5172	19 11 52.5	0.512
20	4 48 12.39	2.3351	17 22 40.8	4.886	20	6 45 18.64	2.5193	19 11 17.9	0.641
21	4 50 32.65	2.3402	17 27 31.1	4.791	21	6 47 49.86	2.5212	19 10 35.6	0.770
22	4 52 53.21	2.3452	17 32 15.7	4.695	22	6 50 21.19	2.5231	19 9 45.5	0.900
23	4 55 14.07	2.3502	17 36 54.5	4.597	23	6 52 52.63	2.5248	19 8 47.6	1.029
24	4 57 35.24	2.3552	N.17 41 27.4	4.498	24	6 55 24.17	2.5265	N.19 7 42.0	1.158

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 55 24.17	2.5265	N.19 7 42.0	1.158
1	6 57 55.81	2.5281	19 6 28.6	1.289
2	7 0 27.54	2.5297	19 5 7.3	1.420
3	7 2 59.37	2.5312	19 3 38.2	1.550
4	7 5 31.28	2.5324	19 2 1.3	1.680
5	7 8 3.26	2.5336	19 0 16.6	1.811
6	7 10 35.31	2.5347	18 58 24.0	1.942
7	7 13 7.42	2.5357	18 56 23.6	2.072
8	7 15 39.59	2.5367	18 54 15.4	2.202
9	7 18 11.82	2.5375	18 51 59.3	2.333
10	7 20 44.09	2.5382	18 49 35.4	2.463
11	7 23 16.40	2.5388	18 47 3.7	2.593
12	7 25 48.75	2.5393	18 44 24.2	2.723
13	7 28 21.12	2.5397	18 41 36.9	2.853
14	7 30 53.52	2.5401	18 38 41.8	2.983
15	7 33 25.94	2.5404	18 35 38.9	3.113
16	7 35 58.37	2.5405	18 32 28.2	3.242
17	7 38 30.80	2.5405	18 29 9.8	3.372
18	7 41 3.23	2.5404	18 25 43.6	3.501
19	7 43 35.65	2.5403	18 22 9.7	3.629
20	7 46 8.07	2.5402	18 18 28.1	3.757
21	7 48 40.47	2.5398	18 14 38.9	3.884
22	7 51 12.85	2.5394	18 10 42.0	4.011
23	7 53 45.20	2.5389	N.18 6 37.5	4.138

MONDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 56 17.52	2.5383	N.18 2 25.4	4.265
1	7 58 49.80	2.5377	17 58 5.7	4.391
2	8 1 22.04	2.5369	17 53 38.5	4.517
3	8 3 54.23	2.5360	17 49 3.7	4.642
4	8 6 26.36	2.5350	17 44 21.4	4.767
5	8 8 58.43	2.5340	17 39 31.7	4.890
6	8 11 30.44	2.5329	17 34 34.6	5.013
7	8 14 2.38	2.5317	17 29 30.1	5.136
8	8 16 34.25	2.5305	17 24 18.3	5.257
9	8 19 6.04	2.5291	17 18 59.2	5.378
10	8 21 37.74	2.5276	17 13 32.9	5.499
11	8 24 9.35	2.5261	17 7 59.3	5.620
12	8 26 40.87	2.5245	17 2 18.5	5.739
13	8 29 12.29	2.5228	16 56 30.6	5.857
14	8 31 43.61	2.5211	16 50 35.7	5.974
15	8 34 14.83	2.5194	16 44 33.7	6.091
16	8 36 45.94	2.5175	16 38 24.7	6.207
17	8 39 16.93	2.5155	16 32 8.8	6.322
18	8 41 47.80	2.5135	16 25 46.0	6.437
19	8 44 18.55	2.5114	16 19 16.4	6.550
20	8 46 49.17	2.5093	16 12 40.0	6.662
21	8 49 19.66	2.5071	16 5 56.9	6.773
22	8 51 50.02	2.5048	15 59 7.2	6.883
23	8 54 20.24	2.5024	15 52 10.9	6.993
24	8 56 50.31	2.5000	N.15 45 8.0	7.102

TUESDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 56 50.31	2.5000	N.15 45 8.0	7.102
1	8 59 20.24	2.4976	15 37 58.6	7.210
2	9 1 50.02	2.4952	15 30 42.8	7.316
3	9 4 19.66	2.4927	15 23 20.7	7.421
4	9 6 49.14	2.4900	15 15 52.3	7.526
5	9 9 18.46	2.4872	15 8 17.6	7.629
6	9 11 47.61	2.4845	15 0 36.8	7.731
7	9 14 16.60	2.4818	14 52 49.9	7.832
8	9 16 45.43	2.4791	14 44 56.9	7.933
9	9 19 14.09	2.4762	14 36 57.9	8.032
10	9 21 42.58	2.4733	14 28 53.1	8.128
11	9 24 10.89	2.4704	14 20 42.5	8.224
12	9 26 39.03	2.4675	14 12 26.2	8.319
13	9 29 6.99	2.4645	14 4 4.2	8.414
14	9 31 34.77	2.4614	13 55 36.5	8.507
15	9 34 2.36	2.4583	13 47 3.3	8.599
16	9 36 29.77	2.4553	13 38 24.6	8.690
17	9 38 57.00	2.4522	13 29 40.5	8.779
18	9 41 24.04	2.4491	13 20 51.1	8.867
19	9 43 50.89	2.4459	13 11 56.4	8.954
20	9 46 17.55	2.4427	13 2 56.6	9.039
21	9 48 44.01	2.4394	12 53 51.7	9.123
22	9 51 10.28	2.4362	12 44 41.8	9.206
23	9 53 36.36	2.4331	N.12 35 27.0	9.287

WEDNESDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 56 2.25	2.4298	N.12 26 7.3	9.368
1	9 58 27.94	2.4265	12 16 42.8	9.447
2	10 0 53.43	2.4232	12 7 13.6	9.524
3	10 3 18.72	2.4198	11 57 39.9	9.600
4	10 5 43.81	2.4165	11 48 1.6	9.676
5	10 8 8.70	2.4132	11 38 18.8	9.750
6	10 10 33.40	2.4100	11 28 31.6	9.822
7	10 12 57.90	2.4066	11 18 40.1	9.893
8	10 15 22.19	2.4032	11 8 44.4	9.962
9	10 17 46.28	2.3998	10 58 44.6	10.031
10	10 20 10.17	2.3965	10 48 40.7	10.098
11	10 22 33.86	2.3932	10 38 32.8	10.163
12	10 24 57.35	2.3898	10 28 21.1	10.227
13	10 27 20.64	2.3865	10 18 5.6	10.290
14	10 29 43.73	2.3832	10 7 46.3	10.352
15	10 32 6.62	2.3798	9 57 23.3	10.412
16	10 34 29.31	2.3765	9 46 56.8	10.471
17	10 36 51.80	2.3732	9 36 26.8	10.528
18	10 39 14.10	2.3700	9 25 53.4	10.584
19	10 41 36.20	2.3667	9 15 16.7	10.639
20	10 43 58.10	2.3633	9 4 36.7	10.692
21	10 46 19.80	2.3600	8 53 53.6	10.744
22	10 48 41.30	2.3568	8 43 7.4	10.795
23	10 51 2.61	2.3536	8 32 18.2	10.843
24	10 53 23.73	2.3504	N. 8 21 26.2	10.890

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 53 23.73	2.3504	N. 8 21 26.2	10.890
1	10 55 44.66	2.3472	8 10 31.4	10.937
2	10 58 5.39	2.3439	7 59 33.8	10.983
3	11 0 25.93	2.3408	7 48 33.5	11.027
4	11 2 46.29	2.3377	7 37 30.6	11.069
5	11 5 6.46	2.3346	7 26 25.2	11.110
6	11 7 26.44	2.3315	7 15 17.4	11.149
7	11 9 46.24	2.3285	7 4 7.3	11.187
8	11 12 5.86	2.3254	6 52 54.9	11.224
9	11 14 25.29	2.3223	6 41 40.4	11.259
10	11 16 44.54	2.3194	6 30 23.8	11.294
11	11 19 3.62	2.3165	6 19 5.1	11.327
12	11 21 22.52	2.3136	6 7 44.5	11.358
13	11 23 41.25	2.3107	5 56 22.1	11.388
14	11 25 59.80	2.3078	5 44 57.9	11.417
15	11 28 18.18	2.3049	5 33 32.0	11.445
16	11 30 36.39	2.3022	5 22 4.5	11.471
17	11 32 54.44	2.2994	5 10 35.5	11.495
18	11 35 12.32	2.2967	4 59 5.1	11.518
19	11 37 30.04	2.2940	4 47 33.3	11.541
20	11 39 47.60	2.2913	4 36 0.2	11.562
21	11 42 4.99	2.2886	4 24 25.8	11.582
22	11 44 22.23	2.2861	4 12 50.3	11.600
23	11 46 39.32	2.2836	N. 4 1 13.8	11.617

FRIDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 48 56.26	2.2811	N. 3 49 36.3	11.632
1	11 51 13.05	2.2786	3 37 57.9	11.647
2	11 53 29.69	2.2761	3 26 18.7	11.660
3	11 55 46.18	2.2737	3 14 38.7	11.672
4	11 58 2.53	2.2713	3 2 58.0	11.683
5	12 0 18.74	2.2691	2 51 16.7	11.692
6	12 2 34.82	2.2668	2 39 34.9	11.700
7	12 4 50.76	2.2646	2 27 52.7	11.708
8	12 7 6.57	2.2624	2 16 10.0	11.714
9	12 9 22.25	2.2602	2 4 27.0	11.718
10	12 11 37.80	2.2581	1 52 43.8	11.721
11	12 13 53.22	2.2560	1 41 0.5	11.722
12	12 16 8.52	2.2540	1 29 17.1	11.723
13	12 18 23.70	2.2521	1 17 33.7	11.723
14	12 20 38.77	2.2502	1 5 50.3	11.722
15	12 22 53.72	2.2482	0 54 7.1	11.719
16	12 25 8.55	2.2463	0 42 24.1	11.715
17	12 27 23.28	2.2446	0 30 41.3	11.710
18	12 29 37.90	2.2428	0 18 58.9	11.703
19	12 31 52.41	2.2410	N. 0 7 16.9	11.696
20	12 34 6.82	2.2394	S. 0 4 24.6	11.687
21	12 36 21.14	2.2378	0 16 5.5	11.677
22	12 38 35.36	2.2362	0 27 45.8	11.667
23	12 40 49.49	2.2347	0 39 25.5	11.655
24	12 43 3.52	2.2331	S. 0 51 4.4	11.641

SATURDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 43 3.52	2.2331	S. 0 51 4.4	11.641
1	12 45 17.46	2.2317	1 2 42.4	11.627
2	12 47 31.32	2.2303	1 14 19.6	11.612
3	12 49 45.10	2.2290	1 25 55.8	11.595
4	12 51 58.80	2.2277	1 37 31.0	11.577
5	12 54 12.42	2.2263	1 49 5.1	11.558
6	12 56 25.96	2.2251	2 0 38.0	11.538
7	12 58 39.43	2.2239	2 12 9.7	11.517
8	13 0 52.83	2.2228	2 23 40.1	11.496
9	13 3 6.17	2.2217	2 35 9.2	11.473
10	13 5 19.44	2.2207	2 46 36.9	11.449
11	13 7 32.65	2.2197	2 58 3.1	11.423
12	13 9 45.80	2.2187	3 9 27.7	11.397
13	13 11 58.90	2.2178	3 20 50.7	11.370
14	13 14 11.94	2.2169	3 32 12.1	11.342
15	13 16 24.93	2.2161	3 43 31.7	11.312
16	13 18 37.87	2.2153	3 54 49.5	11.282
17	13 20 50.76	2.2145	4 6 5.5	11.251
18	13 23 3.61	2.2138	4 17 19.6	11.218
19	13 25 16.42	2.2132	4 28 31.7	11.185
20	13 27 29.19	2.2125	4 39 41.8	11.151
21	13 29 41.92	2.2119	4 50 49.8	11.115
22	13 31 54.62	2.2114	5 1 55.6	11.078
23	13 34 7.29	2.2109	S. 5 12 59.2	11.041

SUNDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 36 19.93	2.2104	S. 5 24 0.5	11.002
1	13 38 32.54	2.2100	5 34 59.5	10.963
2	13 40 45.13	2.2097	5 45 56.1	10.923
3	13 42 57.70	2.2093	5 56 50.3	10.882
4	13 45 10.25	2.2090	6 7 42.0	10.840
5	13 47 22.78	2.2087	6 18 31.1	10.796
6	13 49 35.30	2.2085	6 29 17.5	10.752
7	13 51 47.80	2.2083	6 40 1.3	10.707
8	13 54 0.30	2.2082	6 50 42.4	10.662
9	13 56 12.79	2.2081	7 1 20.7	10.615
10	13 58 25.27	2.2080	7 11 56.2	10.567
11	14 0 37.75	2.2079	7 22 28.8	10.519
12	14 2 50.22	2.2079	7 32 58.5	10.470
13	14 5 2.70	2.2080	7 43 25.2	10.419
14	14 7 15.18	2.2080	7 53 48.8	10.368
15	14 9 27.66	2.2081	8 4 9.3	10.316
16	14 11 40.15	2.2082	8 14 26.7	10.263
17	14 13 52.65	2.2083	8 24 40.8	10.208
18	14 16 5.15	2.2085	8 34 51.6	10.153
19	14 18 17.67	2.2088	8 44 59.1	10.098
20	14 20 30.21	2.2091	8 55 3.3	10.042
21	14 22 42.76	2.2094	9 5 4.1	9.984
22	14 24 55.33	2.2097	9 15 1.4	9.926
23	14 27 7.92	2.2099	9 24 55.2	9.867
24	14 29 20.52	2.2102	S. 9 34 45.5	9.808

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 29 20.52	2.2102	S. 9 34 45.5	9.808
1	14 31 33.15	2.2106	9 44 32.2	9.747
2	14 33 45.80	2.2111	9 54 15.2	9.685
3	14 35 58.48	2.2116	10 3 54.4	9.623
4	14 38 11.19	2.2121	10 13 29.9	9.560
5	14 40 23.93	2.2125	10 23 1.6	9.497
6	14 42 36.69	2.2129	10 32 29.5	9.432
7	14 44 49.48	2.2135	10 41 53.5	9.367
8	14 47 2.31	2.2141	10 51 13.5	9.300
9	14 49 15.17	2.2147	11 0 29.5	9.232
10	14 51 28.07	2.2153	11 9 41.4	9.165
11	14 53 41.01	2.2160	11 18 49.3	9.097
12	14 55 53.99	2.2166	11 27 53.1	9.028
13	14 58 7.01	2.2172	11 36 52.7	8.958
14	15 0 20.06	2.2178	11 45 48.1	8.887
15	15 2 33.15	2.2185	11 54 39.2	8.816
16	15 4 46.28	2.2192	12 3 26.0	8.744
17	15 6 59.45	2.2199	12 12 8.4	8.671
18	15 9 12.67	2.2207	12 20 46.5	8.598
19	15 11 25.93	2.2214	12 29 20.2	8.524
20	15 13 39.24	2.2222	12 37 49.4	8.449
21	15 15 52.59	2.2229	12 46 14.0	8.373
22	15 18 5.99	2.2237	12 54 34.1	8.296
23	15 20 19.43	2.2244	S.13 2 49.6	8.219

TUESDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 22 32.92	2.2252	S.13 11 0.4	8.142
1	15 24 46.46	2.2261	13 19 6.6	8.063
2	15 27 0.05	2.2269	13 27 8.0	7.984
3	15 29 13.69	2.2277	13 35 4.7	7.905
4	15 31 27.37	2.2284	13 42 56.6	7.824
5	15 33 41.10	2.2292	13 50 43.6	7.743
6	15 35 54.88	2.2301	13 58 25.8	7.662
7	15 38 8.71	2.2309	14 6 3.1	7.580
8	15 40 22.59	2.2317	14 13 35.4	7.497
9	15 42 36.52	2.2326	14 21 2.7	7.413
10	15 44 50.50	2.2334	14 28 25.0	7.330
11	15 47 4.53	2.2342	14 35 42.3	7.246
12	15 49 18.61	2.2351	14 42 54.5	7.160
13	15 51 32.74	2.2359	14 50 1.5	7.074
14	15 53 46.92	2.2367	14 57 3.4	6.988
15	15 56 1.14	2.2374	15 4 0.1	6.902
16	15 58 15.41	2.2382	15 10 51.6	6.814
17	16 0 29.73	2.2391	15 17 37.8	6.726
18	16 2 44.10	2.2398	15 24 18.7	6.637
19	16 4 58.51	2.2406	15 30 54.3	6.548
20	16 7 12.97	2.2414	15 37 24.5	6.459
21	16 9 27.48	2.2422	15 43 49.4	6.370
22	16 11 42.03	2.2429	15 50 8.9	6.279
23	16 13 56.62	2.2436	15 56 22.9	6.188
24	16 16 11.26	2.2443	S.16 2 31.4	6.096

WEDNESDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 16 11.26	2.2443	S.16 2 31.4	6.096
1	16 18 25.94	2.2450	16 8 34.4	6.004
2	16 20 40.66	2.2457	16 14 31.9	5.912
3	16 22 55.43	2.2464	16 20 23.9	5.820
4	16 25 10.23	2.2470	16 26 10.3	5.726
5	16 27 25.07	2.2477	16 31 51.0	5.632
6	16 29 39.95	2.2483	16 37 26.1	5.538
7	16 31 54.87	2.2489	16 42 55.5	5.444
8	16 34 9.82	2.2494	16 48 19.3	5.349
9	16 36 24.80	2.2499	16 53 37.4	5.253
10	16 38 39.81	2.2505	16 58 49.7	5.158
11	16 40 54.86	2.2511	17 3 56.3	5.062
12	16 43 9.94	2.2516	17 8 57.1	4.965
13	16 45 25.05	2.2520	17 13 52.1	4.867
14	16 47 40.18	2.2524	17 18 41.2	4.770
15	16 49 55.34	2.2528	17 23 24.5	4.672
16	16 52 10.52	2.2532	17 28 1.9	4.575
17	16 54 25.72	2.2536	17 32 33.5	4.477
18	16 56 40.95	2.2539	17 36 59.2	4.378
19	16 58 56.19	2.2542	17 41 18.9	4.279
20	17 1 11.45	2.2544	17 45 32.7	4.181
21	17 3 26.72	2.2547	17 49 40.6	4.082
22	17 5 42.01	2.2549	17 53 42.5	3.982
23	17 7 57.31	2.2551	S.17 57 38.4	3.882

THURSDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 10 12.62	2.2552	S.18 1 28.3	3.782
1	17 12 27.94	2.2553	18 5 12.2	3.681
2	17 14 43.26	2.2554	18 8 50.0	3.580
3	17 16 58.59	2.2555	18 12 21.8	3.479
4	17 19 13.92	2.2554	18 15 47.5	3.378
5	17 21 29.24	2.2553	18 19 7.2	3.277
6	17 23 44.56	2.2552	18 22 20.8	3.176
7	17 25 59.87	2.2552	18 25 28.3	3.074
8	17 28 15.18	2.2551	18 28 29.7	2.973
9	17 30 30.48	2.2549	18 31 25.1	2.871
10	17 32 45.77	2.2547	18 34 14.3	2.769
11	17 35 1.04	2.2544	18 36 57.4	2.667
12	17 37 16.30	2.2542	18 39 34.3	2.564
13	17 39 31.54	2.2538	18 42 5.1	2.462
14	17 41 46.76	2.2533	18 44 29.8	2.360
15	17 44 1.95	2.2529	18 46 48.3	2.257
16	17 46 17.11	2.2525	18 49 0.7	2.155
17	17 48 32.25	2.2521	18 51 6.9	2.052
18	17 50 47.36	2.2515	18 53 6.9	1.949
19	17 53 2.43	2.2509	18 55 0.8	1.847
20	17 55 17.47	2.2503	18 56 48.5	1.744
21	17 57 32.47	2.2497	18 58 30.1	1.641
22	17 59 47.43	2.2489	19 0 5.5	1.538
23	18 2 2.34	2.2482	19 1 34.7	1.436
24	18 4 17.21	2.2474	S.19 2 57.8	1.333

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 21.					**SUNDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 4 17.21	2.2474	S.19 2 57.8	1.333	0	19 50 26.96	2.1611	S.18 11 56.5	3.346
1	18 6 32.03	2.2466	19 4 14.7	1.231	1	19 52 36.55	2.1585	18 8 33.1	3.434
2	18 8 46.80	2.2457	19 5 25.5	1.128	2	19 54 45.98	2.1558	18 5 4.5	3.521
3	18 11 1.51	2.2447	19 6 30.1	1.026	3	19 56 55.24	2.1530	18 1 30.6	3.608
4	18 13 16.16	2.2438	19 7 28.6	0.923	4	19 59 4.34	2.1502	17 57 51.5	3.695
5	18 15 30.76	2.2428	19 8 20.9	0.821	5	20 1 13.27	2.1475	17 54 7.2	3.781
6	18 17 45.30	2.2417	19 9 7.1	0.719	6	20 3 22.04	2.1447	17 50 17.8	3.867
7	18 19 59.77	2.2406	19 9 47.2	0.617	7	20 5 30.64	2.1419	17 46 23.2	3.952
8	18 22 14.17	2.2395	19 10 21.2	0.515	8	20 7 39.07	2.1391	17 42 23.6	4.036
9	18 24 28.51	2.2384	19 10 49.0	0.413	9	20 9 47.33	2.1362	17 38 18.9	4.120
10	18 26 42.78	2.2372	19 11 10.7	0.311	10	20 11 55.42	2.1334	17 34 9.2	4.204
11	18 28 56.97	2.2359	19 11 26.3	0.210	11	20 14 3.34	2.1306	17 29 54.5	4.287
12	18 31 11.08	2.2345	19 11 35.9	0 109	12	20 16 11.09	2.1277	17 25 34.8	4.369
13	18 33 25.11	2.2332	19 11 39.4	−0.007	13	20 18 18.66	2.1247	17 21 10.2	4.451
14	18 35 39.06	2.2318	19 11 36.8	+0.094	14	20 20 26.06	2.1217	17 16 40.7	4.532
15	18 37 52.92	2.2303	19 11 28.1	0.195	15	20 22 33.28	2.1188	17 12 6.4	4.612
16	18 40 6.70	2.2289	19 11 13.4	0.295	16	20 24 40.32	2.1158	17 7 27.3	4.692
17	18 42 20.39	2.2273	19 10 52.7	0.396	17	20 26 47.18	2.1129	17 2 43.4	4.771
18	18 44 33.98	2.2258	19 10 25.9	0.496	18	20 28 53.87	2.1100	16 57 54.8	4.850
19	18 46 47.48	2.2242	19 9 53.1	0.596	19	20 31 0.38	2.1069	16 53 1.4	4.928
20	18 49 0.88	2.2225	19 9 14.4	0.695	20	20 33 6.70	2.1038	16 48 3.4	5.005
21	18 51 14.18	2.2208	19 8 29.7	0.795	21	20 35 12.84	2.1008	16 43 0.8	5.082
22	18 53 27.38	2.2191	19 7 39.0	0.894	22	20 37 18.80	2.0978	16 37 53.6	5.158
23	18 55 40.47	2.2174	S.19 6 42.4	0.993	23	20 39 24.58	2.0947	S.16 32 41.8	5.234
	SATURDAY 22.					**MONDAY 24.**			
0	18 57 53.46	2.2156	S.19 5 39.8	1.092	0	20 41 30.17	2.0917	S.16 27 25.5	5.309
1	19 0 6.34	2.2137	19 4 31.3	1.190	1	20 43 35.58	2.0887	16 22 4.7	5.383
2	19 2 19.10	2.2117	19 3 17.0	1.288	2	20 45 40.81	2.0856	16 16 39.5	5.457
3	19 4 31.75	2.2098	19 1 56.8	1.386	3	20 47 45.85	2.0825	16 11 9.9	5.530
4	19 6 44.28	2.2078	19 0 30.7	1.483	4	20 49 50.71	2.0794	16 5 35.9	5.603
5	19 8 56.69	2.2058	18 58 58.8	1.580	5	20 51 55.38	2.0763	15 59 57.5	5.675
6	19 11 8.98	2.2038	18 57 21.1	1.677	6	20 53 59.87	2.0732	15 54 14.9	5.745
7	19 13 21.15	2.2017	18 55 37.6	1.773	7	20 56 4.17	2.0702	15 48 28.1	5.816
8	19 15 33.19	2.1996	18 53 48.4	1.868	8	20 58 8.29	2.0671	15 42 37.0	5.886
9	19 17 45.10	2.1974	18 51 53.4	1.964	9	21 0 12.22	2.0640	15 36 41.7	5.956
10	19 19 56.88	2.1952	18 49 52.7	2.059	10	21 2 15.97	2.0609	15 30 42.3	6.024
11	19 22 8.53	2.1930	18 47 46.3	2.154	11	21 4 19.53	2.0578	15 24 38.8	6.092
12	19 24 20.04	2.1907	18 45 34.2	2.248	12	21 6 22.91	2.0547	15 18 31.2	6.160
13	19 26 31.41	2.1884	18 43 16.5	2.342	13	21 8 26.10	2.0517	15 12 19.6	6.227
14	19 28 42.65	2.1861	18 40 53.2	2.435	14	21 10 29.11	2.0486	15 6 4.0	6.292
15	19 30 53.75	2.1837	18 38 24.3	2.528	15	21 12 31.93	2.0455	14 59 44.5	6.357
16	19 33 4.70	2.1813	18 35 49.8	2.621	16	21 14 34.57	2.0424	14 53 21.1	6.422
17	19 35 15.51	2.1789	18 33 9.7	2.714	17	21 16 37.02	2.0393	14 46 53.9	6.485
18	19 37 26.17	2.1765	18 30 24.1	2.806	18	21 18 39.29	2.0362	14 40 22.9	6.548
19	19 39 36.69	2.1740	18 27 33.0	2.897	19	21 20 41.37	2.0332	14 33 48.1	6.611
20	19 41 47.05	2.1714	18 24 36.5	2.987	20	21 22 43.27	2.0302	14 27 9.5	6.674
21	19 43 57.26	2.1689	18 21 34.6	3.077	21	21 24 44.99	2.0272	14 20 27.2	6.736
22	19 46 7.32	2.1663	18 18 27.3	3.167	22	21 26 46.53	2.0242	14 13 41.2	6.796
23	19 48 17.22	2.1637	18 15 14.6	3.257	23	21 28 47.89	2.0211	14 6 51.7	6.855
24	19 50 26.96	2.1611	S.18 11 56.5	3.346	24	21 30 49.06	2.0180	S.13 59 58.6	6.914

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 30 49.06	2.0180	S.13 59 58.6	6.914
1	21 32 50.05	2.0151	13 53 2.0	6.973
2	21 34 50.87	2.0122	13 46 1.8	7.032
3	21 36 51.51	2.0092	13 38 58.1	7.090
4	21 38 51.97	2.0062	13 31 51.0	7.146
5	21 40 52.25	2.0032	13 24 40.6	7.202
6	21 42 52.35	2.0002	13 17 26.8	7.257
7	21 44 52.28	1.9973	13 10 9.7	7.312
8	21 46 52.03	1.9944	13 2 49.4	7.366
9	21 48 51.61	1.9916	12 55 25.8	7.420
10	21 50 51.02	1.9887	12 47 59.0	7.472
11	21 52 50.26	1.9858	12 40 29.1	7.523
12	21 54 49.32	1.9829	12 32 56.2	7.574
13	21 56 48.21	1.9801	12 25 20.2	7.625
14	21 58 46.94	1.9774	12 17 41.2	7.676
15	22 0 45.50	1.9747	12 9 59.1	7.726
16	22 2 43.90	1.9719	12 2 14.1	7.774
17	22 4 42.13	1.9691	11 54 26.2	7.822
18	22 6 40.19	1.9663	11 46 35.4	7.870
19	22 8 38.09	1.9637	11 38 41.8	7.917
20	22 10 35.84	1.9611	11 30 45.4	7.962
21	22 12 33.43	1.9585	11 22 46.3	8.007
22	22 14 30.86	1.9558	11 14 44.5	8.052
23	22 16 28.13	1.9532	S.11 6 40.0	8.097

WEDNESDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 18 25.25	1.9507	S.10 58 32.8	8.141
1	22 20 22.22	1.9482	10 50 23.1	8.184
2	22 22 19.04	1.9457	10 42 10.8	8.226
3	22 24 15.70	1.9432	10 33 56.0	8.267
4	22 26 12.22	1.9407	10 25 38.7	8.308
5	22 28 8.59	1.9383	10 17 19.0	8.349
6	22 30 4.82	1.9359	10 8 56.8	8.389
7	22 32 0.90	1.9335	10 0 32.3	8.428
8	22 33 56.84	1.9312	9 52 5.5	8.466
9	22 35 52.65	1.9290	9 43 36.4	8.504
10	22 37 48.32	1.9267	9 35 5.0	8.542
11	22 39 43.85	1.9244	9 26 31.4	8.578
12	22 41 39.25	1.9222	9 17 55.7	8.613
13	22 43 34.51	1.9200	9 9 17.9	8.648
14	22 45 29.65	1.9179	9 0 37.9	8.684
15	22 47 24.66	1.9158	8 51 55.8	8.718
16	22 49 19.55	1.9137	8 43 11.7	8.752
17	22 51 14.31	1.9117	8 34 25.6	8.784
18	22 53 8.95	1.9097	8 25 37.6	8.816
19	22 55 3.47	1.9077	8 16 47.6	8.848
20	22 56 57.87	1.9057	8 7 55.8	8.879
21	22 58 52.16	1.9038	7 59 2.1	8.910
22	23 0 46.33	1.9020	7 50 6.6	8.939
23	23 2 40.40	1.9002	7 41 9.4	8.968
24	23 4 34.36	1.8984	S. 7 32 10.4	8.997

THURSDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 4 34.36	1.8984	S. 7 32 10.4	8.997
1	23 6 28.21	1.8967	7 23 9.7	9.025
2	23 8 21.96	1.8949	7 14 7.4	9.053
3	23 10 15.60	1.8932	7 5 3.4	9.080
4	23 12 9.14	1.8916	6 55 57.8	9.106
5	23 14 2.59	1.8900	6 46 50.7	9.132
6	23 15 55.94	1.8884	6 37 42.0	9.157
7	23 17 49.20	1.8869	6 28 31.8	9.182
8	23 19 42.37	1.8854	6 19 20.2	9.205
9	23 21 35.45	1.8840	6 10 7.2	9.228
10	23 23 28.45	1.8826	6 0 52.8	9.251
11	23 25 21.37	1.8812	5 51 37.1	9.273
12	23 27 14.20	1.8799	5 42 20.0	9.295
13	23 29 6.96	1.8787	5 33 1.7	9.316
14	23 30 59.64	1.8774	5 23 42.1	9.337
15	23 32 52.25	1.8762	5 14 21.3	9.357
16	23 34 44.79	1.8751	5 4 59.3	9.376
17	23 36 37.26	1.8739	4 55 36.2	9.395
18	23 38 29.66	1.8728	4 46 11.9	9.414
19	23 40 22.00	1.8718	4 36 46.5	9.432
20	23 42 14.28	1.8708	4 27 20.1	9.448
21	23 44 6.50	1.8699	4 17 52.8	9.464
22	23 45 58.67	1.8691	4 8 24.5	9.480
23	23 47 50.79	1.8682	S. 3 58 55.2	9.496

FRIDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 49 42.86	1.8674	S. 3 49 25.0	9.511
1	23 51 34.88	1.8667	3 39 53.9	9.525
2	23 53 26.86	1.8659	3 30 22.0	9.538
3	23 55 18.79	1.8652	3 20 49.3	9.552
4	23 57 10.68	1.8646	3 11 15.8	9.565
5	23 59 2.54	1.8641	3 1 41.5	9.577
6	0 0 54.37	1.8636	2 52 6.5	9.588
7	0 2 46.17	1.8631	2 42 30.9	9.599
8	0 4 37.94	1.8626	2 32 54.6	9.610
9	0 6 29.68	1.8622	2 23 17.7	9.620
10	0 8 21.40	1.8619	2 13 40.2	9.629
11	0 10 13.10	1.8616	2 4 2.2	9.638
12	0 12 4.79	1.8613	1 54 23.6	9.646
13	0 13 56.46	1.8611	1 44 44.6	9.654
14	0 15 48.12	1.8609	1 35 5.1	9.662
15	0 17 39.77	1.8608	1 25 25.2	9.668
16	0 19 31.42	1.8608	1 15 44.9	9.674
17	0 21 23.07	1.8608	1 6 4.3	9.680
18	0 23 14.71	1.8608	0 56 23.3	9.686
19	0 25 6.36	1.8609	0 46 42.0	9.690
20	0 26 58.02	1.8610	0 37 0.5	9.693
21	0 28 49.68	1.8612	0 27 18.8	9.697
22	0 30 41.36	1.8614	0 17 36.9	9.700
23	0 32 33.05	1.8617	S. 0 7 54.8	9.702
24	0 34 24.76	1.8620	N. 0 1 47.4	9.704

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 34 24.76	1.8620	N. 0 1 47.4	9.704
1	0 36 16.49	1.8624	0 11 29.7	9.706
2	0 38 8.25	1.8628	0 21 12.1	9.707
3	0 40 0.03	1.8632	0 30 54.5	9.707
4	0 41 51.84	1.8638	0 40 36.9	9.707
5	0 43 43.69	1.8644	0 50 19.3	9.706
6	0 45 35.57	1.8650	1 0 1.6	9.704
7	0 47 27.49	1.8657	1 9 43.8	9.702
8	0 49 19.45	1.8664	1 19 25.9	9.700
9	0 51 11.46	1.8672	1 29 7.8	9.697
10	0 53 3.52	1.8681	1 38 49.5	9.693
11	0 54 55.63	1.8689	1 48 31.0	9.689
12	0 56 47.79	1.8698	1 58 12.2	9.684
13	0 58 40.01	1.8708	2 7 53.1	9.679
14	1 0 32.29	1.8719	2 17 33.7	9.674
15	1 2 24.64	1.8730	2 27 14.0	9.668
16	1 4 17.05	1.8741	2 36 53.9	9.661
17	1 6 9.53	1.8752	2 46 33.3	9.654
18	1 8 2.08	1.8765	2 56 12.3	9.646
19	1 9 54.71	1.8778	3 5 50.8	9.637
20	1 11 47.42	1.8791	3 15 28.8	9.628
21	1 13 40.20	1.8804	3 25 6.2	9.618
22	1 15 33.07	1.8819	3 34 43.0	9.608
23	1 17 26.03	1.8835	N. 3 44 19.2	9.598

SUNDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 19 19.09	1.8851	N. 3 53 54.8	9.587
1	1 21 12.24	1.8866	4 3 29.7	9.575
2	1 23 5.48	1.8882	4 13 3.8	9.563
3	1 24 58.82	1.8899	4 22 37.2	9.550
4	1 26 52.27	1.8917	4 32 9.8	9.536
5	1 28 45.83	1.8935	4 41 41.5	9.522
6	1 30 39.49	1.8953	4 51 12.4	9.507
7	1 32 33.27	1.8972	5 0 42.4	9.492
8	1 34 27.16	1.8992	5 10 11.5	9.476
9	1 36 21.17	1.9012	5 19 39.6	9.460
10	1 38 15.30	1.9033	5 29 6.7	9.444
11	1 40 9.56	1.9054	5 38 32.8	9.427
12	1 42 3.95	1.9076	5 47 57.9	9.409
13	1 43 58.47	1.9098	5 57 21.9	9.390
14	1 45 53.12	1.9120	6 6 44.7	9.370
15	1 47 47.91	1.9143	6 16 6.3	9.350
16	1 49 42.84	1.9167	6 25 26.7	9.329
17	1 51 37.92	1.9192	6 34 45.8	9.307
18	1 53 33.14	1.9216	6 44 3.6	9.286
19	1 55 28.51	1.9242	6 53 20.1	9.264
20	1 57 24.04	1.9267	7 2 35.3	9.242
21	1 59 19.72	1.9293	7 11 49.1	9.218
22	2 1 15.56	1.9320	7 21 1.4	9.193
23	2 3 11.56	1.9347	7 30 12.2	9.169
24	2 5 7.73	1.9375	N. 7 39 21.6	9.144

MONDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 5 7.73	1.9375	N. 7 39 21.6	9.144
1	2 7 4.06	1.9403	7 48 29.5	9.118
2	2 9 0.57	1.9432	7 57 35.8	9.091
3	2 10 57.25	1.9462	8 6 40.4	9.063
4	2 12 54.11	1.9492	8 15 43.3	9.034
5	2 14 51.15	1.9522	8 24 44.5	9.006
6	2 16 48.37	1.9553	8 33 44.0	8.977
7	2 18 45.78	1.9584	8 42 41.8	8.947
8	2 20 43.38	1.9616	8 51 37.7	8.916
9	2 22 41.17	1.9648	9 0 31.7	8.884
10	2 24 39.16	1.9681	9 9 23.8	8.852
11	2 26 37.34	1.9713	9 18 14.0	8.820
12	2 28 35.72	1.9747	9 27 2.2	8.787
13	2 30 34.31	1.9782	9 35 48.4	8.753
14	2 32 33.11	1.9817	9 44 32.5	8.718
15	2 34 32.11	1.9852	9 53 14.5	8.683
16	2 36 31.33	1.9887	10 1 54.4	8.647
17	2 38 30.76	1.9923	10 10 32.1	8.610
18	2 40 30.41	1.9960	10 19 7.6	8.572
19	2 42 30.28	1.9997	10 27 40.8	8.534
20	2 44 30.38	2.0035	10 36 11.7	8.495
21	2 46 30.70	2.0072	10 44 40.2	8.455
22	2 48 31.25	2.0111	10 53 6.3	8.414
23	2 50 32.03	2.0150	N. 11 1 29.9	8.373

TUESDAY, FEBRUARY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	2 52 33.05	2.0189	N. 11 9 51.1	8.332

PHASES OF THE MOON.

			d	h	m
☽	First Quarter	Jan.	2	0	20.5
○	Full Moon		9	10	32.2
☾	Last Quarter		16	3	22.0
●	New Moon		23	15	1.1
☽	First Quarter		31	20	26.8

			d	h
☾	Apogee	Jan.	0	0.2
☾	Perigee		11	18.0
☾	Apogee		27	18.6

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Sun	W.	79° 0′ 4″	3467	80° 21′ 5″	3463	81° 42′ 10″	3460	83° 3′ 19″	3456
	Mars	W.	53 24 1	3375	54 46 46	3371	56 9 36	3366	57 32 31	3362
	Aldebaran	E.	68 15 45	3067	66 46 55	3063	65 18 0	3059	63 49 0	3055
2	Sun	W.	89 50 41	3422	91 12 33	3414	92 34 34	3405	93 56 45	3396
	Mars	W.	64 28 43	3329	65 52 21	3320	67 16 9	3312	68 40 7	3303
	Fomalhaut	W.	42 9 42	3715	43 26 13	3671	44 43 31	3629	46 1 34	3590
	Aldebaran	E.	56 22 28	3026	54 52 47	3018	53 22 57	3010	51 52 57	3001
	Saturn	E.	97 56 2	3002	96 25 52	2995	94 55 33	2987	93 25 4	2979
	Pollux	E.	100 18 15	3091	98 49 54	3083	97 21 24	3075	95 52 44	3066
3	Sun	W.	100 50 26	3343	102 13 48	3332	103 37 23	3319	105 1 13	3306
	Mars	W.	75 42 45	3250	77 7 55	3238	78 33 19	3226	79 58 57	3214
	Fomalhaut	W.	52 41 43	3424	54 3 32	3395	55 25 54	3368	56 48 47	3341
	α Pegasi	W.	39 12 31	3799	40 27 34	3737	41 43 42	3679	43 0 51	3626
	Aldebaran	E.	44 20 10	2954	42 48 59	2942	41 17 34	2931	39 45 55	2920
	Saturn	E.	85 49 54	2931	84 18 14	2920	82 46 21	2909	81 14 13	2897
	Pollux	E.	88 26 34	3018	86 56 43	3006	85 26 38	2996	83 56 20	2984
4	Sun	W.	112 4 18	3236	113 29 45	3220	114 55 30	3204	116 21 34	3188
	Mars	W.	87 11 6	3143	88 38 23	3128	90 5 59	3113	91 33 53	3097
	Fomalhaut	W.	63 50 42	3217	65 16 31	3194	66 42 47	3171	68 9 31	3149
	α Pegasi	W.	49 40 0	3403	51 2 13	3365	52 25 9	3329	53 48 47	3295
	Aldebaran	E.	32 3 43	2855	30 30 26	2841	28 56 51	2826	27 22 57	2811
	Saturn	E.	73 29 39	2833	71 55 54	2819	70 21 51	2805	68 47 29	2790
	Pollux	E.	76 21 4	2922	74 49 13	2909	73 17 6	2896	71 44 42	2883
5	Sun	W.	123 36 45	3105	125 4 48	3088	126 33 12	3070	128 1 58	3053
	Fomalhaut	W.	75 29 42	3043	76 59 1	3023	78 28 45	3003	79 58 54	2983
	α Pegasi	W.	60 56 31	3140	62 23 52	3113	63 51 46	3086	65 20 13	3059
	Saturn	E.	60 50 49	2714	59 14 28	2698	57 37 46	2682	56 0 42	2666
	Pollux	E.	63 58 20	2814	62 24 10	2800	60 49 42	2785	59 14 55	2772
	Regulus	E.	99 36 24	2733	98 0 28	2717	96 24 11	2701	94 47 33	2685
6	Fomalhaut	W.	87 35 40	2891	89 8 11	2873	90 41 4	2856	92 14 19	2840
	α Pegasi	W.	72 50 21	2938	74 21 52	2915	75 53 52	2893	77 26 20	2872
	α Arietis	W.	29 38 10	3231	31 3 42	3158	32 30 42	3091	33 59 3	3030
	Saturn	E.	47 49 56	2585	46 10 40	2569	44 31 2	2552	42 51 1	2536
	Pollux	E.	51 16 39	2707	49 40 9	2696	48 3 24	2685	46 26 24	2675
	Regulus	E.	86 38 43	2600	84 59 48	2583	83 20 29	2566	81 40 47	2548
7	α Arietis	W.	41 37 39	2796	43 12 12	2760	44 47 33	2725	46 23 40	2692
	Saturn	E.	34 25 27	2459	32 43 16	2445	31 0 45	2431	29 17 54	2417
	Pollux	E.	38 18 22	2640	36 40 22	2638	35 2 19	2638	33 24 16	2642
	Regulus	E.	73 16 22	2464	71 34 18	2448	69 51 51	2431	68 9 1	2415
8	α Arietis	W.	54 34 21	2556	56 14 17	2533	57 54 45	2511	59 35 43	2490
	Aldebaran	W.	20 39 14	2339	22 24 17	2324	24 9 41	2311	25 55 25	2296
	Regulus	E.	59 29 11	2339	57 44 8	2324	55 58 44	2310	54 12 59	2296
9	α Arietis	W.	68 7 23	2401	69 50 56	2387	71 34 50	2373	73 19 4	2360
	Aldebaran	W.	34 48 59	2334	36 36 36	2323	38 24 29	2312	40 12 38	2303

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Sun	W.	84° 24′ 33″	3449	85° 45′ 54″	3443	87° 7′ 22″	3437	88° 28′ 57″	3429
	Mars	W.	58 55 31	3356	60 18 38	3350	61 41 52	3344	63 5 13	3336
	Aldebaran	E.	62 19 55	3050	60 50 44	3044	59 21 26	3038	57 52 1	3032
2	Sun	W.	95 19 6	3386	96 41 38	3376	98 4 22	3365	99 27 18	3355
	Mars	W.	70 4 15	3294	71 28 34	3283	72 53 5	3273	74 17 48	3261
	Fomalhaut	W.	47 20 19	3554	48 39 44	3518	49 59 48	3486	51 20 28	3454
	Aldebaran	E.	50 22 46	2993	48 52 25	2984	47 21 52	2974	45 51 7	2965
	Saturn	E.	91 54 25	2971	90 23 36	2962	88 52 35	2951	87 21 21	2941
	Pollux	E.	94 23 53	3057	92 54 51	3048	91 25 38	3038	89 56 12	3028
3	Sun	W.	106 25 18	3293	107 49 38	3278	109 14 15	3265	110 39 8	3250
	Mars	W.	81 24 50	3200	82 50 59	3187	84 17 24	3173	85 44 6	3158
	Fomalhaut	W.	58 12 11	3315	59 36 5	3289	61 0 29	3265	62 25 21	3241
	α Pegasi	W.	44 18 57	3576	45 37 57	3529	46 57 49	3484	48 18 31	3442
	Aldebaran	E.	38 14 1	2907	36 41 51	2894	35 9 25	2882	33 36 43	2868
	Saturn	E.	79 41 50	2885	78 9 12	2873	76 36 18	2859	75 3 7	2846
	Pollux	E.	82 25 47	2972	80 54 59	2960	79 23 56	2948	77 52 38	2935
4	Sun	W.	117 47 57	3173	119 14 39	3156	120 41 41	3139	122 9 3	3123
	Mars	W.	93 2 6	3081	94 30 39	3065	95 59 32	3048	97 28 45	3031
	Fomalhaut	W.	69 36 41	3128	71 4 17	3105	72 32 20	3085	74 0 48	3064
	α Pegasi	W.	55 13 4	3262	56 38 0	3230	58 3 34	3198	59 29 45	3169
	Aldebaran	E.	25 48 44	2797	24 14 12	2782	22 39 20	2766	21 4 7	2750
	Saturn	E.	67 12 48	2775	65 37 48	2761	64 2 29	2745	62 26 49	2730
	Pollux	E.	70 12 1	2869	68 39 2	2855	67 5 46	2842	65 32 12	2828
5	Sun	W.	129 31 5	3035	131 0 34	3018	132 30 25	3000	134 0 38	2981
	Fomalhaut	W.	81 29 28	2964	83 0 26	2946	84 31 47	2927	86 3 32	2909
	α Pegasi	W.	66 49 13	3034	68 18 44	3009	69 48 46	2984	71 19 19	2961
	Saturn	E.	54 23 17	2650	52 45 30	2634	51 7 21	2618	49 28 50	2601
	Pollux	E.	57 39 51	2759	56 4 29	2745	54 28 49	2732	52 52 52	2720
	Regulus	E.	93 10 33	2668	91 33 10	2651	89 55 24	2634	88 17 15	2617
6	Fomalhaut	W.	93 47 55	2824	95 21 52	2808	96 56 9	2794	98 30 45	2779
	α Pegasi	W.	78 59 15	2851	80 32 37	2831	82 6 25	2811	83 40 38	2793
	α Arietis	W.	35 28 39	2974	36 59 24	2924	38 31 12	2879	40 3 58	2836
	Saturn	E.	41 10 38	2520	39 29 53	2504	37 48 46	2489	36 7 17	2474
	Pollux	E.	44 49 10	2665	43 11 43	2657	41 34 5	2649	39 56 17	2644
	Regulus	E.	80 0 41	2532	78 20 12	2515	76 39 19	2497	74 58 2	2481
7	α Arietis	W.	48 0 30	2662	49 38 1	2633	51 16 11	2606	52 54 58	2580
	Saturn	E.	27 34 44	2405	25 51 17	2394	24 7 34	2384	22 23 36	2375
	Pollux	E.	31 46 18	2650	30 8 31	2661	28 30 59	2678	26 53 50	2703
	Regulus	E.	66 25 47	2399	64 42 11	2384	62 58 13	2368	61 13 53	2353
8	α Arietis	W.	61 17 10	2471	62 59 4	2452	64 41 25	2433	66 24 12	2417
	Aldebaran	W.	27 41 30	2283	29 27 54	2270	31 14 37	2258	33 1 39	2245
	Regulus	E.	52 26 53	2283	50 40 28	2270	48 53 45	2258	47 6 43	2246
9	α Arietis	W.	75 3 36	2348	76 48 26	2337	78 33 32	2326	80 18 53	2317
	Aldebaran	W.	42 1 1	2193	43 49 39	2184	45 38 30	2176	47 27 34	2168

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
9	Regulus	E.	45° 19′ 24″	2235	43° 31′ 48″	2223	41° 43′ 55″	2212	39° 55′ 46″	2203
	Spica	E.	99 0 15	2260	97 13 17	2249	95 26 2	2238	93 38 31	2229
10	α Arietis	W.	82 4 28	2308	83 50 16	2300	85 36 15	2294	87 22 23	2289
	Aldebaran	W.	49 16 50	2161	51 6 17	2154	52 55 54	2148	54 45 40	2143
	Regulus	E.	30 51 36	2161	29 2 10	2155	27 12 34	2149	25 22 49	2143
	Spica	E.	84 37 30	2186	82 48 42	2180	80 59 45	2174	79 10 39	2169
	JUPITER	E.	95 57 17	2203	94 8 54	2196	92 20 20	2190	90 31 37	2184
11	Aldebaran	W.	63 56 18	2124	65 46 41	2122	67 37 7	2120	69 27 35	2120
	SATURN	W.	23 17 59	2139	25 7 59	2132	26 58 10	2126	28 48 30	2121
	Spica	E.	70 3 30	2153	68 13 52	2152	66 24 12	2152	64 34 32	2151
	JUPITER	E.	81 26 14	2165	79 36 54	2163	77 47 31	2162	75 58 6	2161
12	Aldebaran	W.	78 39 57	2124	80 30 20	2126	82 20 39	2129	84 10 54	2133
	SATURN	W.	38 1 12	2116	39 51 47	2117	41 42 20	2119	43 32 50	2122
	Pollux	W.	35 45 23	2307	37 31 12	2295	39 17 19	2285	41 3 41	2277
	Spica	E.	55 26 32	2163	53 37 8	2167	51 47 51	2172	49 58 42	2178
	JUPITER	E.	66 51 1	2166	65 1 42	2169	63 12 27	2172	61 23 17	2176
	Antares	E.	101 17 28	2188	99 28 43	2190	97 40 0	2192	95 51 21	2195
13	Aldebaran	W.	93 20 35	2157	95 10 8	2163	96 59 32	2169	98 48 46	2176
	SATURN	W.	52 44 6	2142	54 34 1	2148	56 23 47	2154	58 13 24	2161
	Pollux	W.	49 57 27	2264	51 44 20	2264	53 31 12	2266	55 18 2	2268
	Spica	E.	40 55 30	2220	39 7 32	2231	37 19 50	2243	35 32 27	2257
	JUPITER	E.	52 19 7	2202	50 30 42	2208	48 42 27	2216	46 54 23	2223
	Antares	E.	86 49 31	2219	85 1 32	2226	83 13 43	2233	81 26 4	2240
	SUN	E.	131 34 26	2481	129 52 46	2487	128 11 15	2494	126 29 53	2501
14	SATURN	W.	67 18 52	2198	69 7 23	2206	70 55 42	2214	72 43 48	2224
	Pollux	W.	64 10 51	2293	65 57 1	2299	67 43 2	2306	69 28 53	2313
	Regulus	W.	27 44 15	2215	29 32 20	2224	31 20 12	2233	33 7 51	2242
	JUPITER	E.	37 57 8	2269	36 10 23	2279	34 23 53	2291	32 37 40	2302
	Antares	E.	72 30 48	2284	70 44 25	2294	68 58 17	2305	67 12 25	2316
	SUN	E.	118 5 37	2540	116 25 20	2549	114 45 15	2559	113 5 23	2568
15	SATURN	W.	81 40 50	2271	83 27 32	2281	85 13 59	2291	87 0 12	2301
	Pollux	W.	78 15 18	2355	79 59 57	2364	81 44 23	2374	83 28 35	2384
	Regulus	W.	42 2 39	2289	43 48 54	2300	45 34 54	2310	47 20 39	2320
	Antares	E.	58 27 17	2378	56 43 10	2391	54 59 23	2405	53 15 56	2420
	SUN	E.	104 49 24	2618	103 10 54	2629	101 32 39	2640	99 54 39	2651
16	SATURN	W.	95 47 30	2353	97 32 12	2364	99 16 39	2374	101 0 51	2384
	Regulus	W.	56 5 41	2371	57 49 57	2382	59 33 57	2393	61 17 42	2403
	Antares	E.	44 44 12	2504	43 3 4	2523	41 22 23	2544	39 42 11	2566
	SUN	E.	91 48 19	2707	90 11 48	2718	88 35 32	2729	86 59 30	2740
17	Regulus	W.	69 52 43	2455	71 34 59	2465	73 17 1	2476	74 58 48	2486
	Spica	W.	17 16 55	2741	18 52 40	2706	20 29 12	2680	22 6 18	2663
	SUN	E.	79 3 5	2796	77 28 32	2808	75 54 14	2818	74 20 10	2829
18	Regulus	W.	83 24 13	2535	85 4 37	2545	86 44 47	2555	88 24 44	2565

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
9	Regulus	E.	38° 7′ 23″	2194	36° 18′ 46″	2184	34° 29′ 55″	2176	32° 40′ 51″	2169
	Spica	E.	91 50 46	2219	90 2 47	2210	88 14 34	2201	86 26 8	2193
10	α Arietis	W.	89 8 39	2283	90 55 3	2279	92 41 34	2276	94 28 9	2273
	Aldebaran	W.	56 35 34	2137	58 25 36	2133	60 15 45	2130	62 5 59	2126
	Regulus	E.	23 32 56	2139	21 42 56	2134	19 52 49	2131	18 2 37	2128
	Spica	E.	77 21 25	2165	75 32 4	2161	73 42 37	2157	71 53 5	2155
	JUPITER	E.	88 42 46	2179	86 53 47	2174	85 4 41	2171	83 15 30	2168
11	Aldebaran	W.	71 18 4	2119	73 8 34	2120	74 59 3	2120	76 49 31	2122
	SATURN	W.	30 38 57	2118	32 29 28	2116	34 20 2	2116	36 10 37	2116
	Spica	E.	62 44 51	2153	60 55 12	2154	59 5 35	2156	57 16 1	2159
	JUPITER	E.	74 8 40	2161	72 19 14	2161	70 29 48	2162	68 40 23	2164
12	Aldebaran	W.	86 1 3	2137	87 51 6	2141	89 41 3	2145	91 30 53	2151
	SATURN	W.	45 23 16	2125	47 13 37	2128	49 3 53	2132	50 54 3	2137
	Pollux	W.	42 50 14	2271	44 36 56	2268	46 23 43	2265	48 10 34	2264
	Spica	E.	48 9 41	2184	46 20 50	2192	44 32 10	2200	42 43 43	2210
	JUPITER	E.	59 34 13	2180	57 45 15	2184	55 56 24	2190	54 7 41	2196
	Antares	E.	94 2 46	2199	92 14 17	2203	90 25 54	2208	88 37 38	2214
13	Aldebaran	W.	100 37 50	2183	102 26 43	2190	104 15 25	2198	106 3 55	2206
	SATURN	W.	60 2 51	2167	61 52 8	2174	63 41 14	2182	65 30 9	2190
	Pollux	W.	57 4 48	2272	58 51 29	2276	60 38 4	2281	62 24 32	2287
	Spica	E.	33 45 24	2272	31 58 43	2289	30 12 27	2309	28 26 40	2331
	JUPITER	E.	45 6 30	2231	43 18 49	2240	41 31 21	2249	39 44 7	2260
	Antares	E.	79 38 36	2248	77 51 20	2256	76 4 16	2265	74 17 25	2274
	SUN	E.	124 48 41	2508	123 7 39	2515	121 26 47	2523	119 46 6	2532
14	SATURN	W.	74 31 40	2233	76 19 18	2242	78 6 43	2251	79 53 54	2262
	Pollux	W.	71 14 34	2320	73 0 4	2329	74 45 21	2337	76 30 26	2346
	Regulus	W.	34 55 16	2251	36 42 28	2260	38 29 26	2270	40 16 10	2280
	JUPITER	E.	30 51 44	2315	29 6 6	2328	27 20 47	2342	25 35 49	2358
	Antares	E.	65 26 49	2327	63 41 29	2339	61 56 27	2352	60 11 43	2364
	SUN	E.	111 25 44	2577	109 46 18	2588	108 7 6	2596	106 28 8	2608
15	SATURN	W.	88 46 10	2311	90 31 53	2322	92 17 21	2333	94 2 33	2343
	Pollux	W.	85 12 32	2394	86 56 15	2404	88 39 44	2415	90 22 58	2424
	Regulus	W.	49 6 9	2331	50 51 24	2341	52 36 24	2350	54 21 10	2361
	Antares	E.	51 32 50	2436	49 50 6	2451	48 7 44	2468	46 25 46	2485
	SUN	E.	98 16 53	2662	96 39 22	2673	95 2 6	2684	93 25 5	2695
16	SATURN	W.	102 44 48	2395	104 28 30	2406	106 11 56	2417	107 55 7	2426
	Regulus	W.	63 1 12	2414	64 44 27	2424	66 27 27	2435	68 10 12	2445
	Antares	E.	38 2 29	2589	36 23 19	2615	34 44 44	2642	33 6 46	2672
	SUN	E.	85 23 43	2751	83 48 11	2763	82 12 54	2774	80 37 52	2785
17	Regulus	W.	76 40 21	2496	78 21 40	2506	80 2 45	2516	81 43 36	2526
	Spica	W.	23 43 48	2651	25 21 34	2643	26 59 30	2637	28 37 34	2635
	SUN	E.	72 46 20	2841	71 12 45	2851	69 39 23	2862	68 6 15	2873
18	Regulus	W.	90 4 27	2574	91 43 57	2583	93 23 15	2593	95 2 20	2602

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
18	Spica W.	30° 15′ 42″	2634	31° 53′ 51″	2635	33° 31′ 58″	2638	35° 10′ 2″	2640
	JUPITER W.	17 47 24	2649	19 25 13	2645	21 3 7	2644	22 41 2	2646
	SUN E.	66 33 21	2883	65 0 41	2894	63 28 14	2904	61 56 0	2915
19	Regulus W.	96 41 12	2611	98 19 52	2621	99 58 19	2629	101 36 34	2638
	Spica W.	43 19 2	2665	44 56 29	2671	46 33 48	2678	48 10 58	2684
	JUPITER W.	30 49 23	2672	32 26 41	2678	34 3 50	2684	35 40 51	2692
	SUN E.	54 18 9	2965	52 47 13	2976	51 16 30	2985	49 45 59	2995
20	Spica W.	56 14 33	2719	57 50 48	2726	59 26 53	2733	61 2 49	2741
	JUPITER W.	43 43 30	2728	45 19 32	2736	46 55 24	2744	48 31 5	2752
	SUN E.	42 16 28	3044	40 47 10	3054	39 18 4	3064	37 49 10	3073
21	Spica W.	68 59 59	2779	70 34 55	2786	72 9 41	2794	73 44 17	2801
	JUPITER W.	56 27 2	2790	58 1 43	2798	59 36 14	2805	61 10 35	2814
	Antares W.	24 30 24	3118	25 58 12	3086	27 26 39	3061	28 55 36	3041
	SUN E.	30 27 37	3122	28 59 54	3132	27 32 23	3143	26 5 5	3153
25	SUN W.	15 17 18	3411	16 39 22	3411	18 1 26	3412	19 23 29	3415
	α Arietis E.	75 39 9	3146	74 11 55	3155	72 44 52	3164	71 18 0	3173
	Aldebaran E.	107 40 2	2988	106 9 34	2994	104 39 14	3001	103 9 2	3006
26	SUN W.	26 12 47	3433	27 34 26	3436	28 56 0	3441	30 17 30	3446
	α Arietis E.	64 6 21	3220	62 40 35	3229	61 15 0	3240	59 49 38	3250
	Aldebaran E.	95 39 48	3034	94 10 17	3039	92 40 52	3043	91 11 33	3047
27	SUN W.	37 3 58	3462	38 25 5	3464	39 46 9	3467	41 7 10	3469
	α Arietis E.	52 45 59	3308	51 21 57	3321	49 58 11	3335	48 34 39	3349
	Aldebaran E.	83 46 12	3066	82 17 21	3069	80 48 33	3071	79 19 48	3073
28	SUN W.	47 51 50	3475	49 12 42	3474	50 33 35	3474	51 54 28	3473
	α Arietis E.	41 41 38	3439	40 20 6	3463	38 59 0	3488	37 38 22	3515
	Aldebaran E.	71 56 40	3081	70 28 7	3081	68 59 34	3080	67 31 0	3079
29	SUN W.	58 39 15	3463	60 0 20	3461	61 21 28	3456	62 42 41	3453
	Fomalhaut W.	38 55 39	3868	40 9 31	3818	41 24 15	3771	42 39 47	3729
	Aldebaran E.	60 7 55	3072	58 39 11	3069	57 10 24	3066	55 41 33	3062
	SATURN E.	99 32 19	3052	98 3 11	3050	96 34 0	3047	95 4 45	3043
30	SUN W.	69 30 5	3423	70 51 55	3417	72 13 52	3410	73 35 57	3402
	Fomalhaut W.	49 7 37	3558	50 26 57	3530	51 46 48	3503	53 7 9	3477
	α Pegasi W.	36 8 46	4055	37 19 31	3981	38 31 29	3914	39 44 35	3853
	Aldebaran E.	48 15 58	3037	46 46 31	3031	45 16 57	3024	43 47 14	3017
	SATURN E.	87 37 12	3018	86 7 22	3012	84 37 24	3005	83 7 18	2998
	Pollux E.	92 20 39	3101	90 52 31	3095	89 24 15	3087	87 55 50	3081
31	SUN W.	80 28 51	3354	81 52 0	3344	83 15 21	3332	84 38 56	3320
	Fomalhaut W.	59 55 44	3362	61 18 44	3341	62 42 8	3320	64 5 56	3300
	α Pegasi W.	46 4 28	3606	47 22 56	3565	48 42 8	3528	50 2 1	3492
	Aldebaran E.	36 16 14	2973	34 45 28	2964	33 14 30	2954	31 43 19	2942
	SATURN E.	75 34 23	2956	74 3 15	2946	72 31 55	2936	71 0 22	2926
	Pollux E.	80 31 28	3039	79 2 4	3030	77 32 29	3021	76 2 42	3011

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
18	Spica	W.	36° 48′ 2″	2644	38° 25′ 57″	2649	40° 3′ 46″	2654	41° 41′ 28″	2660
	Jupiter	W.	24 18 54	2650	25 56 41	2655	27 34 22	2660	29 11 56	2665
	Sun	E.	60 24 0	2925	58 52 13	2935	57 20 39	2946	55 49 18	2956
19	Regulus	W.	103 14 37	2647	104 52 28	2656	106 30 7	2665	108 7 34	2673
	Spica	W.	49 47 59	2691	51 24 51	2698	53 1 34	2704	54 38 8	2711
	Jupiter	W.	37 17 42	2699	38 54 24	2706	40 30 56	2713	42 7 18	2721
	Sun	E.	48 15 40	3005	46 45 34	3015	45 15 40	3025	43 45 58	3034
20	Spica	W.	62 38 35	2748	64 14 11	2756	65 49 37	2763	67 24 53	2771
	Jupiter	W.	50 6 36	2759	51 41 58	2766	53 17 10	2775	54 52 11	2782
	Sun	E.	36 20 27	3082	34 51 56	3092	33 23 37	3103	31 55 31	3113
21	Spica	W.	75 18 44	2808	76 53 1	2816	78 27 8	2825	80 1 4	2832
	Jupiter	W.	62 44 45	2821	64 18 45	2828	65 52 36	2836	67 26 17	2844
	Antares	W.	30 24 58	3025	31 54 40	3012	33 24 38	3002	34 54 48	2995
	Sun	E.	24 37 59	3163	23 11 6	3174	21 44 26	3186	20 18 0	3198
25	Sun	W	20 45 29	3418	22 7 25	3422	23 29 17	3426	24 51 4	3430
	α Arietis	E.	69 51 18	3182	68 24 47	3191	66 58 27	3200	65 32 18	3210
	Aldebaran	E.	101 38 57	3013	100 9 0	3018	98 39 10	3023	97 9 26	3028
26	Sun	W.	31 38 55	3449	33 0 16	3452	34 21 34	3455	35 42 48	3459
	α Arietis	E.	58 24 28	3261	56 59 31	3272	55 34 47	3283	54 10 16	3295
	Aldebaran	E.	89 42 19	3052	88 13 10	3056	86 44 6	3060	85 15 7	3063
27	Sun	W.	42 28 9	3470	43 49 7	3471	45 10 3	3473	46 30 57	3474
	α Arietis	E.	47 11 24	3365	45 48 27	3382	44 25 50	3400	43 3 33	3419
	Aldebaran	E.	77 51 6	3076	76 22 27	3078	74 53 50	3078	73 25 14	3080
28	Sun	W.	53 15 22	3472	54 36 17	3471	55 57 14	3469	57 18 13	3466
	α Arietis	E.	36 18 15	3545	34 58 41	3580	33 39 45	3620	32 21 32	3665
	Aldebaran	E.	66 2 25	3079	64 33 50	3078	63 5 14	3077	61 36 36	3074
29	Sun	W.	64 3 58	3448	65 25 20	3443	66 46 48	3437	68 8 23	3431
	Fomalhaut	W.	43 56 3	3691	45 13 0	3654	46 30 36	3620	47 48 49	3587
	Aldebaran	E.	54 12 37	3058	52 43 36	3054	51 14 30	3048	49 45 17	3043
	Saturn	E.	93 35 25	3030	92 6 0	3034	90 36 30	3030	89 6 54	3025
30	Sun	W.	74 58 11	3393	76 20 35	3385	77 43 9	3375	79 5 54	3365
	Fomalhaut	W.	54 27 59	3453	55 49 16	3429	57 11 0	3407	58 33 9	3384
	α Pegasi	W.	40 58 43	3795	42 13 50	3743	43 29 52	3693	44 46 46	3649
	Aldebaran	E.	42 17 22	3009	40 47 21	3001	39 17 10	2993	37 46 48	2983
	Saturn	E.	81 37 3	2991	80 6 39	2983	78 36 5	2974	77 5 20	2965
	Pollux	E.	86 27 17	3073	84 58 35	3065	83 29 43	3057	82 0 41	3048
31	Sun	W.	86 2 44	3307	87 26 47	3294	88 51 5	3282	90 15 38	3267
	Fomalhaut	W.	65 30 7	3280	66 54 42	3261	68 19 39	3242	69 44 59	3222
	α Pegasi	W.	51 22 34	3457	52 43 46	3425	54 5 34	3393	55 27 58	3363
	Aldebaran	E.	30 11 54	2931	28 40 15	2920	27 8 21	2908	25 36 12	2894
	Saturn	E.	69 28 36	2914	67 56 36	2903	66 24 21	2891	64 51 51	2879
	Pollux	E.	74 32 43	3001	73 2 31	2989	71 32 5	2979	70 1 26	2967

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Tues.	1	20 59 21.91	10.187	S. 17 5 53.1	+42.70	16 16.02	68.27	13 49.37	0.330
Wed.	2	21 3 25.97	10.152	16 48 39.3	43.43	16 15.87	68.16	13 56.86	0.295
Thur.	3	21 7 29.20	10.117	16 31 8.1	44.16	16 15.72	68.04	14 3.52	0.261
Frid.	4	21 11 31.59	10.082	16 13 19.7	+44.86	16 15.57	67.93	14 9.34	0.226
Sat.	5	21 15 33.15	10.048	15 55 14.6	45.55	16 15.41	67.81	14 14.33	0.192
SUN.	6	21 19 33.88	10.014	15 36 53.1	46.22	16 15.24	67.70	14 18.49	0.158
Mon.	7	21 23 33.79	9.980	15 18 15.7	+46.88	16 15.07	67.59	14 21.84	0.124
Tues.	8	21 27 32.90	9.947	14 59 22.8	47.52	16 14.90	67.48	14 24.39	0.091
Wed.	9	21 31 31.22	9.914	14 40 14.8	48.14	16 14.72	67.36	14 26.15	0.058
Thur.	10	21 35 28.76	9.882	14 20 52.0	+48.74	16 14.53	67.25	14 27.13	0.026
Frid.	11	21 39 25.52	9.850	14 1 15.0	49.34	16 14.34	67.14	14 27.34	0.006
Sat.	12	21 43 21.52	9.819	13 41 24.0	49.91	16 14.15	67.03	14 26.78	0.037
SUN.	13	21 47 16.78	9.788	13 21 19.5	+50.47	16 13.95	66.92	14 25.49	0.068
Mon.	14	21 51 11.31	9.757	13 1 1.9	50.99	16 13.75	66.81	14 23.47	0.098
Tues.	15	21 55 5.11	9.727	12 40 31.7	51.51	16 13.54	66.71	14 20.73	0.128
Wed.	16	21 58 58.21	9.698	12 19 49.2	+52.01	16 13.33	66.60	14 17.28	0.157
Thur.	17	22 2 50.61	9.669	11 58 54.9	52.50	16 13.12	66.50	14 13.14	0.186
Frid.	18	22 6 42.33	9.641	11 37 49.1	52.97	16 12.90	66.39	14 8.32	0.214
Sat.	19	22 10 33.37	9.613	11 16 32.3	+53.42	16 12.68	66.29	14 2.83	0.242
SUN.	20	22 14 23.75	9.586	10 55 4.9	53.85	16 12.46	66.20	13 56.68	0.269
Mon.	21	22 18 13.47	9.559	10 33 27.2	54.27	16 12.24	66.10	13 49.87	0.296
Tues.	22	22 22 2.56	9.533	10 11 39.8	+54.67	16 12.02	66.01	13 42.42	0.322
Wed.	23	22 25 51.02	9.507	9 49 43.0	55.05	16 11.79	65.92	13 34.35	0.348
Thur.	24	22 29 38.86	9.481	9 27 37.3	55.41	16 11.56	65.83	13 25.66	0.374
Frid.	25	22 33 26.09	9.456	9 5 23.2	+55.76	16 11.33	65.75	13 16.37	0.399
Sat.	26	22 37 12.74	9.432	8 43 1.0	56.08	16 11.10	65.66	13 6.49	0.423
SUN.	27	22 40 58.81	9.408	8 20 31.2	56.40	16 10.87	65.58	12 56.03	0.447
Mon.	28	22 44 44.31	9.385	7 57 54.1	56.69	16 10.64	65.50	12 45.01	0.470
Tues.	29	22 48 29.26	9.363	S. 7 35 10.2	+56.96	16 10.40	65.43	12 33.44	0.492

NOTE.—The mean time of semidiameter passing may be found by subtracting 0s.18 from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Tues.	1	20 59 19.56	10.186	S. 17 6 2.9	+42.69	13 49.30	0.330	20 45 30.26
Wed.	2	21 3 23.61	10.151	16 48 49.4	43.42	13 56.79	0.295	20 49 26.82
Thur.	3	21 7 26.83	10.117	16 31 18.4	44.15	14 3.46	0.261	20 53 23.37
Frid.	4	21 11 29.21	10.082	16 13 30.3	+44.85	14 9.29	0.226	20 57 19.92
Sat.	5	21 15 30.76	10.048	15 55 25.4	45.54	14 14.29	0.192	21 1 16.47
SUN.	6	21 19 31.49	10.014	15 37 4.1	46.21	14 18.46	0.158	21 5 13.03
Mon.	7	21 23 31.40	9.980	15 18 26.9	+46.87	14 21.82	0.124	21 9 9.58
Tues.	8	21 27 30.51	9.947	14 59 34.2	47.51	14 24.37	0.091	21 13 6.14
Wed.	9	21 31 28.83	9.914	14 40 26.4	48.13	14 26.14	0.058	21 17 2.69
Thur.	10	21 35 26.37	9.882	14 21 3.8	+48.73	14 27.13	0.026	21 20 59.25
Frid.	11	21 39 23.14	9.850	14 1 26.9	49.33	14 27.34	0.006	21 24 55.80
Sat.	12	21 43 19.15	9.819	13 41 36.1	49.90	14 26.79	0.037	21 28 52.36
SUN.	13	21 47 14.42	9.788	13 21 31.7	+50.46	14 25.51	0.068	21 32 48.91
Mon.	14	21 51 8.96	9.758	13 1 14.2	50.99	14 23.49	0.098	21 36 45.47
Tues.	15	21 55 2.78	9.728	12 40 44.1	51.51	14 20.76	0.128	21 40 42.02
Wed.	16	21 58 55.90	9.699	12 20 1.7	+52.01	14 17.32	0.157	21 44 38.58
Thur.	17	22 2 48.32	9.670	11 59 7.4	52.50	14 13.19	0.186	21 48 35.13
Frid.	18	22 6 40.06	9.642	11 38 1.6	52.97	14 8.38	0.214	21 52 31.68
Sat.	19	22 10 31.12	9.614	11 16 44.8	+53.42	14 2.89	0.242	21 56 28.23
SUN.	20	22 14 21.52	9.587	10 55 17.4	53.85	13 56.74	0.269	22 0 24.78
Mon.	21	22 18 11.27	9.560	10 33 39.7	54.27	13 49.94	0.296	22 4 21.33
Tues.	22	22 22 0.38	9.534	10 11 52.3	+54.67	13 42.49	0.322	22 8 17.89
Wed.	23	22 25 48.87	9.508	9 49 55.5	55.05	13 34.43	0.348	22 12 14.44
Thur.	24	22 29 36.74	9.482	9 27 49.8	55.41	13 25.74	0.374	22 16 11.00
Frid.	25	22 33 24.00	9.457	9 5 35.6	+55.76	13 16.45	0.399	22 20 7.55
Sat.	26	22 37 10.68	9.433	8 43 13.3	56.08	13 6.58	0.423	22 24 4.10
SUN.	27	22 40 56.78	9.409	8 20 43.4	56.40	12 56.13	0.447	22 28 0.65
Mon.	28	22 44 42.31	9.386	7 58 6.2	56.69	12 45.10	0.470	22 31 57.21
Tues.	29	22 48 27.30	9.364	S. 7 35 22.1	+56.97	12 33.54	0.492	22 35 53.76

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour,
+ 9ˢ.8565.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	32	312 22 15.6	22 19.0	152.15	− 0.77	9.9937196	+ 26.3	3 13 57.88
2	33	313 23 6.5	23 9.8	152.09	0.78	9.9937838	27.2	3 10 1.97
3	34	314 23 56.1	23 59.3	152.03	0.76	9.9938501	28.1	3 6 6.06
4	35	315 24 44.2	24 47.3	151.98	− 0.71	9.9939186	+ 29.0	3 2 10.15
5	36	316 25 30.9	25 33.8	151.92	0.63	9.9939894	29.9	2 58 14.25
6	37	317 26 16.2	26 19.0	151.86	0.53	9.9940625	30.9	2 54 18.34
7	38	318 27 0.1	27 2.8	151.80	− 0.41	9.9941379	+ 31.9	2 50 22.43
8	39	319 27 42.7	27 45.3	151.75	0.28	9.9942158	32.9	2 46 26.52
9	40	320 28 24.0	28 26.5	151.69	0.14	9.9942960	33.9	2 42 30.61
10	41	321 29 4.1	29 6.4	151.64	− 0.01	9.9943785	+ 34.8	2 38 34.70
11	42	322 29 42.9	29 45.1	151.59	+ 0.10	9.9944631	35.7	2 34 38.79
12	43	323 30 20.5	30 22.6	151.54	0.20	9.9945498	36.6	2 30 42.88
13	44	324 30 56.9	30 58.9	151.49	+ 0.28	9.9946386	+ 37.4	2 26 46.98
14	45	325 31 32.1	31 34.0	151.44	0.33	9.9947293	38.1	2 22 51.06
15	46	326 32 6.1	32 7.9	151.39	0.35	9.9948216	38.8	2 18 55.15
16	47	327 32 38.9	32 40.6	151.34	+ 0.34	9.9949155	+ 39.4	2 14 59.24
17	48	328 33 10.5	33 12.1	151.29	0.30	9.9950107	39.9	2 11 3.34
18	49	329 33 40.8	33 42.3	151.23	0.23	9.9951072	40.4	2 7 7.44
19	50	330 34 9.7	34 11.1	151.17	+ 0.13	9.9952048	+ 40.9	2 3 11.53
20	51	331 34 37.2	34 38.5	151.11	+ 0.02	9.9953035	41.3	1 59 15.63
21	52	332 35 3.2	35 4.4	151.05	− 0.10	9.9954031	41.6	1 55 19.71
22	53	333 35 27.6	35 28.7	150.99	− 0.24	9.9955033	+ 41.9	1 51 23.80
23	54	334 35 50.4	35 51.4	150.92	0.37	9.9956042	42.2	1 47 27.89
24	55	335 36 11.5	36 12.4	150.85	0.50	9.9957058	42.5	1 43 31.98
25	56	336 36 30.8	36 31.7	150.77	− 0.61	9.9958082	+ 42.8	1 39 36.08
26	57	337 36 48.2	36 49.0	150.69	0.70	9.9959113	43.1	1 35 40.17
27	58	338 37 3.6	37 4.3	150.60	0.77	9.9960151	43.4	1 31 44.26
28	59	339 37 16.9	37 17.5	150.52	0.81	9.9961196	43.7	1 27 48.36
29	60	340 37 28.2	37 28.7	150.43	− 0.82	9.9962250	+ 44.1	1 23 52.46

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0ᵈ.0.

Diff. for 1 Hour, — 9ˢ.8296. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 7.7	15 13.4	55 24.3	+1.66	55 45.3	+1.84	6 18.8	1.94	8.4
2	15 19.7	15 26.5	56 8.5	2.01	56 33.5	2.15	7 6.9	2.07	9.4
3	15 33.8	15 41.4	57 0.1	2.27	57 28.0	2.35	7 58.1	2.21	10.4
4	15 49.1	15 57.0	57 56.6	+2.39	58 25.3	+2.38	8 52.6	2.34	11.4
5	16 4.7	16 12.1	58 53.6	2.31	59 20.8	2.19	9 49.9	2.44	12.4
6	16 19.0	16 25.2	59 46.2	2.01	60 9.0	1.77	10 49.1	2.48	13.4
7	16 30.6	16 34.9	60 28.7	+1.49	60 44.7	+1.16	11 48.7	2.47	14.4
8	16 38.1	16 40.1	60 56.4	0.79	61 3.6	+0.40	12 47.5	2.42	15.4
9	16 40.7	16 40.1	61 6.1	+0.01	61 3.9	−0.37	13 44 6	2.34	16.4
10	16 38.3	16 35.4	60 57.2	−0.73	60 46.4	−1.06	14 40.0	2.27	17.4
11	16 31.4	16 26.6	60 31.8	1.35	60 14.1	1.58	15 33.9	2.22	18.4
12	16 21.1	16 15.1	59 53.9	1.76	59 31.8	1.90	16 26.7	2.18	19.4
13	16 8.7	16 2.1	59 8.4	−1.99	58 44.2	−2.03	17 18.9	2.17	20.4
14	15 55.5	15 48.9	58 19.8	2.02	57 55.7	1.99	18 10.9	2.17	21.4
15	15 42.5	15 36.3	57 32.1	1.93	57 9.3	1.85	19 3.0	2.16	22.4
16	15 30.4	15 24.8	56 47.6	−1.76	56 27.2	−1.65	19 54.8	2.14	23.4
17	15 19.6	15 14 8	56 8.1	1.53	55 50.4	1.42	20 46.0	2.11	24.4
18	15 10.3	15 6.3	55 34.1	1.31	55 19.1	1.19	21 36.1	2.06	25.4
19	15 2.6	14 59.2	55 5.5	−1.08	54 53.2	−0.97	22 24.8	1.99	26.4
20	14 56.2	14 53.5	54 42.2	0.87	54 32.4	0.77	23 11.8	1.92	27.4
21	14 51.2	14 49.2	54 23.8	0.67	54 16.4	0.57	23 57.1	1.85	28.4
22	14 47.5	14 46.1	54 10.1	−0.48	54 5.0	−0.38	δ		29.4
23	14 45.0	14 44.3	54 1.1	0.27	53 58.5	−0.16	0 40.9	1.80	0.6
24	14 44.0	14 44.0	53 57.2	−0.05	53 57.2	+0.07	1 23.5	1.76	1.6
25	14 44.4	14 45.3	53 58.8	+0.20	54 2.0	+0.34	2 5.6	1.74	2.6
26	14 46.6	14 48.4	54 6.9	0.48	54 13.6	0.64	2 47.6	1.76	3.6
27	14 50.8	14 53.6	54 22.2	0.80	54 32.8	0.98	3 30.3	1.80	4.6
28	14 57.1	15 1.2	54 45.6	1.16	55 0.5	1.33	4 14.3	1.87	5.6
29	15 5.8	15 11.1	55 17.6	+1.51	55 36.8	+1.69	5 0.2	1.97	6.6

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 52 33.05	2.0189	N.11 9 51.1	8.332
1	2 54 34.30	2.0229	11 18 9.8	8.289
2	2 56 35.80	2.0270	11 26 25.8	8.245
3	2 58 37.54	2.0310	11 34 39.2	8.201
4	3 0 39.52	2.0351	11 42 49.9	8.156
5	3 2 41.75	2.0392	11 50 57.9	8.110
6	3 4 44.23	2.0434	11 59 3.1	8.063
7	3 6 46.96	2.0477	12 7 5.5	8.016
8	3 8 49.95	2.0520	12 15 5.0	7.968
9	3 10 53.20	2.0563	12 23 1.7	7.920
10	3 12 56.71	2.0607	12 30 55.4	7.870
11	3 15 0.48	2.0650	12 38 46.1	7.819
12	3 17 4.51	2.0694	12 46 33.7	7.768
13	3 19 8.81	2.0739	12 54 18.2	7.716
14	3 21 13.38	2.0784	13 1 59.6	7.663
15	3 23 18.22	2.0829	13 9 37.8	7.610
16	3 25 23.33	2.0875	13 17 12.8	7.555
17	3 27 28.72	2.0922	13 24 44.4	7.499
18	3 29 34.39	2.0968	13 32 12.7	7.443
19	3 31 40.34	2.1015	13 39 37.6	7.386
20	3 33 46.57	2.1062	13 46 59.0	7.328
21	3 35 53.08	2.1109	13 54 17.0	7.270
22	3 37 59.88	2.1157	14 1 31.4	7.210
23	3 40 6.97	2.1205	N.14 8 42.2	7.149

WEDNESDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 42 14.34	2.1253	N.14 15 49.3	7.087
1	3 44 22.00	2.1302	14 22 52.7	7.025
2	3 46 29.96	2.1352	14 29 52.3	6.962
3	3 48 38.22	2.1401	14 36 48.1	6.898
4	3 50 46.77	2.1450	14 43 40.1	6.834
5	3 52 55.62	2.1499	14 50 28.2	6.768
6	3 55 4.76	2.1549	14 57 12.3	6.702
7	3 57 14.20	2.1599	15 3 52.4	6.634
8	3 59 23.95	2.1650	15 10 28.4	6.565
9	4 1 34.00	2.1700	15 17 0.2	6.495
10	4 3 44.35	2.1751	15 23 27.8	6.425
11	4 5 55.01	2.1802	15 29 51.2	6.354
12	4 8 5.98	2.1854	15 36 10.3	6.282
13	4 10 17.26	2.1905	15 42 25.1	6.209
14	4 12 28.84	2.1956	15 48 35.4	6.134
15	4 14 40.73	2.2007	15 54 41.2	6.059
16	4 16 52.93	2.2059	16 0 42.5	5.984
17	4 19 5.44	2.2112	16 6 39.3	5.907
18	4 21 18.27	2.2164	16 12 31.4	5.829
19	4 23 31.41	2.2216	16 18 18.8	5.751
20	4 25 44.86	2.2268	16 24 1.5	5.671
21	4 27 58.62	2.2320	16 29 39.3	5.590
22	4 30 12.70	2.2372	16 35 12.3	5.509
23	4 32 27.09	2.2425	16 40 40.4	5.427
24	4 34 41.80	2.2477	N.16 46 3.5	5.343

THURSDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 34 41.80	2.2477	N.16 46 3.5	5.343
1	4 36 56.82	2.2529	16 51 21.6	5.259
2	4 39 12.15	2.2582	16 56 34.6	5.174
3	4 41 27.80	2.2635	17 1 42.5	5.088
4	4 43 43.77	2.2687	17 6 45.2	5.001
5	4 46 0.05	2.2739	17 11 42.6	4.912
6	4 48 16.64	2.2792	17 16 34.6	4.823
7	4 50 33.55	2.2844	17 21 21.3	4.733
8	4 52 50.77	2.2896	17 26 2.6	4.642
9	4 55 8.30	2.2948	17 30 38.4	4.551
10	4 57 26.14	2.3000	17 35 8.7	4.458
11	4 59 44.30	2.3052	17 39 33.4	4.364
12	5 2 2.77	2.3104	17 43 52.4	4.269
13	5 4 21.55	2.3156	17 48 5.7	4.173
14	5 6 40.64	2.3207	17 52 13.2	4.077
15	5 9 0.03	2.3257	17 56 14.9	3.980
16	5 11 19.73	2.3308	18 0 10.8	3.882
17	5 13 39.73	2.3359	18 4 0.8	3.783
18	5 16 0.04	2.3411	18 7 44.8	3.682
19	5 18 20.65	2.3461	18 11 22.7	3.581
20	5 20 41.56	2.3510	18 14 54.5	3.479
21	5 23 2.77	2.3560	18 18 20.2	3.376
22	5 25 24.28	2.3610	18 21 39.6	3.272
23	5 27 46.09	2.3659	N.18 24 52.8	3.167

FRIDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	5 30 8.19	2.3707	N.18 27 59.7	3.062
1	5 32 30.58	2.3756	18 31 0.2	2.956
2	5 34 53.26	2.3804	18 33 54.4	2.849
3	5 37 16.23	2.3852	18 36 42.1	2.740
4	5 39 39.48	2.3899	18 39 23.2	2.631
5	5 42 3.02	2.3947	18 41 57.8	2.522
6	5 44 26.84	2.3993	18 44 25.8	2.411
7	5 46 50.93	2.4038	18 46 47.1	2.299
8	5 49 15.30	2.4084	18 49 1.7	2.186
9	5 51 39.94	2.4129	18 51 9.5	2.073
10	5 54 4.85	2.4174	18 53 10.5	1.960
11	5 56 30.03	2.4218	18 55 4.7	1.846
12	5 58 55.47	2.4261	18 56 52.0	1.731
13	6 1 21.17	2.4304	18 58 32.4	1.614
14	6 3 47.12	2.4347	19 0 5.7	1.497
15	6 6 13.33	2.4389	19 1 32.0	1.379
16	6 8 39.79	2.4431	19 2 51.2	1.261
17	6 11 6.50	2.4472	19 4 3.3	1.142
18	6 13 33.45	2.4512	19 5 8.3	1.023
19	6 16 0.64	2.4551	19 6 6.1	0.902
20	6 18 28.06	2.4590	19 6 56.6	0.781
21	6 20 55.72	2.4629	19 7 39.8	0.659
22	6 23 23.61	2.4667	19 8 15.7	0.537
23	6 25 51.72	2.4703	19 8 44.3	0.415
24	6 28 20.04	2.4738	N.19 9 5.5	0.292

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 28 20.04	2.4738	N.19 9 5.5	0.292
1	6 30 48.58	2.4774	19 9 19.3	0.168
2	6 33 17.33	2.4809	19 9 25.6	+0.043
3	6 35 46.29	2.4843	19 9 24.4	−0.082
4	6 38 15.45	2.4877	19 9 15.7	0.207
5	6 40 44.81	2.4909	19 8 59.5	0.333
6	6 43 14.36	2.4941	19 8 35.7	0.460
7	6 45 44.10	2.4972	19 8 4.3	0.587
8	6 48 14.02	2.5002	19 7 25.3	0.714
9	6 50 44.12	2.5032	19 6 38.6	0.842
10	6 53 14.40	2.5060	19 5 44.2	0.970
11	6 55 44.84	2.5088	19 4 42.2	1.098
12	6 58 15.45	2.5115	19 3 32.5	1.227
13	7 0 46.22	2.5141	19 2 15.0	1.357
14	7 3 17.14	2.5167	19 0 49.7	1.486
15	7 5 48.22	2.5192	18 59 16.7	1.615
16	7 8 19.44	2.5215	18 57 35.9	1.746
17	7 10 50.80	2.5237	18 55 47.2	1.876
18	7 13 22.29	2.5259	18 53 50.8	2.005
19	7 15 53.91	2.5281	18 51 46.6	2.136
20	7 18 25.66	2.5302	18 49 34.5	2.267
21	7 20 57.53	2.5321	18 47 14.6	2.397
22	7 23 29.51	2.5339	18 44 46.8	2.528
23	7 26 1.59	2.5356	N.18 42 11.2	2.659

SUNDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 28 33.78	2.5373	N.18 39 27.7	2.790
1	7 31 6.07	2.5389	18 36 36.4	2.921
2	7 33 38.45	2.5403	18 33 37.2	3.052
3	7 36 10.91	2.5417	18 30 30.1	3.183
4	7 38 43.46	2.5431	18 27 15.2	3.313
5	7 41 16.08	2.5442	18 23 52.5	3.444
6	7 43 48.77	2.5453	18 20 21.9	3.575
7	7 46 21.52	2.5463	18 16 43.5	3.706
8	7 48 54.33	2.5473	18 12 57.2	3.837
9	7 51 27.20	2.5483	18 9 3.1	3.967
10	7 54 0.13	2.5492	18 5 1.2	4.096
11	7 56 33.10	2.5498	18 0 51.6	4.225
12	7 59 6.10	2.5503	17 56 34.2	4.355
13	8 1 39.13	2.5508	17 52 9.0	4.484
14	8 4 12.19	2.5513	17 47 36.1	4.613
15	8 6 45.28	2.5516	17 42 55.5	4.741
16	8 9 18.38	2.5518	17 38 7.2	4.868
17	8 11 51.50	2.5520	17 33 11.3	4.996
18	8 14 24.62	2.5520	17 28 7.7	5.123
19	8 16 57.74	2.5520	17 22 56.5	5.250
20	8 19 30.86	2.5519	17 17 37.7	5.376
21	8 22 3.97	2.5517	17 12 11.4	5.502
22	8 24 37.06	2.5514	17 6 37.5	5.627
23	8 27 10.14	2.5512	17 0 56.2	5.751
24	8 29 43.20	2.5508	N.16 55 7.4	5.875

MONDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 29 43.20	2.5508	N.16 55 7.4	5.875
1	8 32 16.23	2.5503	16 49 11.2	5.998
2	8 34 49.23	2.5496	16 43 7.6	6.121
3	8 37 22.18	2.5488	16 36 56.7	6.242
4	8 39 55.09	2.5481	16 30 38.5	6.363
5	8 42 27.95	2.5473	16 24 13.1	6.483
6	8 45 0.77	2.5465	16 17 40.5	6.603
7	8 47 33.53	2.5455	16 11 0.7	6.722
8	8 50 6.23	2.5445	16 4 13.8	6.840
9	8 52 38.87	2.5434	15 57 19.9	6.957
10	8 55 11.44	2.5422	15 50 19.0	7.073
11	8 57 43.93	2.5409	15 43 11.1	7.189
12	9 0 16.34	2.5395	15 35 56.3	7.303
13	9 2 48.67	2.5382	15 28 34.7	7.417
14	9 5 20.92	2.5368	15 21 6.3	7.530
15	9 7 53.08	2.5352	15 13 31.1	7.642
16	9 10 25.14	2.5336	15 5 49.2	7.752
17	9 12 57.11	2.5320	14 58 0.8	7.861
18	9 15 28.98	2.5303	14 50 5.9	7.969
19	9 18 0.74	2.5286	14 42 4.5	8.077
20	9 20 32.40	2.5267	14 33 56.6	8.184
21	9 23 3.95	2.5248	14 25 42.4	8.288
22	9 25 35.38	2.5228	14 17 22.0	8.392
23	9 28 6.69	2.5209	N.14 8 55.3	8.496

TUESDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 30 37.89	2.5190	N.14 0 22.5	8.598
1	9 33 8.97	2.5169	13 51 43.6	8.698
2	9 35 39.91	2.5146	13 42 58.7	8.797
3	9 38 10.72	2.5124	13 34 7.9	8.895
4	9 40 41.40	2.5102	13 25 11.3	8.992
5	9 43 11.95	2.5080	13 16 8.9	9.087
6	9 45 42.36	2.5057	13 7 0.8	9.182
7	9 48 12.63	2.5033	12 57 47.1	9.275
8	9 50 42.76	2.5010	12 48 27.8	9.367
9	9 53 12.75	2.4986	12 39 3.0	9.457
10	9 55 42.59	2.4961	12 29 32.9	9.546
11	9 58 12.28	2.4937	12 19 57.5	9.634
12	10 0 41.83	2.4912	12 10 16.8	9.721
13	10 3 11.22	2.4886	12 0 31.0	9.806
14	10 5 40.46	2.4860	11 50 40.1	9.889
15	10 8 9.54	2.4833	11 40 44.3	9.971
16	10 10 38.46	2.4807	11 30 43.6	10.052
17	10 13 7.22	2.4781	11 20 38.1	10.131
18	10 15 35.83	2.4754	11 10 27.9	10.208
19	10 18 4.27	2.4727	11 0 13.1	10.285
20	10 20 32.55	2.4700	10 49 53.7	10.360
21	10 23 0.67	2.4672	10 39 29.9	10.433
22	10 25 28.62	2.4645	10 29 1.7	10.505
23	10 27 56.41	2.4617	10 18 29.3	10.575
24	10 30 24.03	2.4589	N.10 7 52.7	10.644

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 30 24.03	2.4589.	N. 10 7 52.7	10.644
1	10 32 51.48	2.4561	9 57 12.0	10.712
2	10 35 18.76	2.4532	9 46 27.3	10.778
3	10 37 45.87	2.4504	9 35 38.7	10.842
4	10 40 12.81	2.4477	9 24 46.3	10.904
5	10 42 39.59	2.4449	9 13 50.2	10.966
6	10 45 6.20	2.4420	9 2 50.4	11.026
7	10 47 32.63	2.4391	8 51 47.1	11.084
8	10 49 58.89	2.4362	8 40 40.3	11.141
9	10 52 24.98	2.4334	8 29 30.2	11.196
10	10 54 50.90	2.4306	8 18 16.8	11.249
11	10 57 16.65	2.4277	8 7 0.3	11.301
12	10 59 42.22	2.4247	7 55 40.7	11.352
13	11 2 7.62	2.4219	7 44 18.1	11.401
14	11 4 32.85	2.4191	7 32 52.6	11.448
15	11 6 57.91	2.4163	7 21 24.4	11.493
16	11 9 22.81	2.4136	7 9 53.5	11.537
17	11 11 47.54	2.4108	6 58 20.0	11.580
18	11 14 12.10	2.4079	6 46 43.9	11.622
19	11 16 36.49	2.4051	6 35 5.4	11.661
20	11 19 0.71	2.4022	6 23 24.6	11.698
21	11 21 24.76	2.3995	6 11 41.6	11.734
22	11 23 48.65	2.3967	5 59 56.5	11.769
23	11 26 12.37	2.3940	N. 5 48 9.3	11.802

THURSDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 28 35.93	2.3913	N. 5 36 20.2	11.834
1	11 30 59.33	2.3886	5 24 29.2	11.864
2	11 33 22.56	2.3859	5 12 36.5	11.893
3	11 35·45.63	2.3832	5 0 42.1	11.920
4	11 38 8.54	2.3805	4 48 46.1	11.945
5	11 40 31.29	2.3778	4 36 48.7	11.968
6	11 42 53.88	2.3752	4 24 49.9	11.991
7	11 45 16.32	2.3726	4 12 49.8	12.012
8	11 47 38.60	2.3700	4 0 48.5	12.032
9	11 50 0.72	2.3674	3 48 46.0	12.050
10	11 52 22.69	2.3649	3 36 42.5	12.066
11	11 54 44.51	2.3624	3 24 38.1	12.079
12	11 57 6.18	2.3599	3 12 33.0	12.092
13	11 59 27.70	2.3575	3 0 27.1	12.104
14	12 1 49.08	2.3551	2 48 20.5	12.115
15	12 4 10.31	2.3527	2 36 13.3	12.124
16	12 6 31.40	2.3502	2 24 5.6	12.131
17	12 8 52.34	2.3478	2 11 57.6	12.136
18	12 11 13.14	2.3455	1 59 49.3	12.140
19	12 13 33.80	2.3432	1 47 40.8	12.143
20	12 15 54.33	2.3410	1 35 32.1	12.145
21	12 18 14.72	2.3387	1 23 23.4	12.144
22	12 20 34.98	2.3366	1 11 14.8	12.142
23	12 22 55.11	2.3344	0 59 6.3	12.140
24	12 25 15.11	2.3323	N. 0 46 58.0	12.136

FRIDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 25 15.11	2.3323	N. 0 46 58.0	12.136
1	12 27 34.98	2.3302	0 34 50.0	12.130
2	12 29 54.73	2.3281	0 22 42.4	12.122
3	12 32 14.35	2.3260	N. 0 10 35.3	12.114
4	12 34 33.85	2.3240	S. 0 1 31.3	12.104
5	12 36 53.23	2.3219	0 13 37.2	12.092
6	12 39 12.48	2.3199	0 25 42.4	12.080
7	12 41 31.62	2.3181	0 37 46.8	12.066
8	12 43 50.65	2.3162	0 49 50.3	12.050
9	12 46 9.56	2.3143	1 1 52.8	12.033
10	12 48 28.36	2.3125	1 13 54.3	12.016
11	12 50 47.06	2.3107	1 25 54.7	11.997
12	12 53 5.65	2.3090	1 37 53.9	11.976
13	12 55 24.14	2.3072	1 49 51.8	11.954
14	12 57 42.52	2.3055	2 1 48.4	11.931
15	13 0 0.80	2.3038	2 13 43.5	11.906
16	13 2 18.98	2.3022	2 25 37.1	11.880
17	13 4 37.07	2.3007	2 37 29.1	11.852
18	13 6 55.06	2.2991	2 49 19.4	11.824
19	13 9 12.96	2.2976	3 1 8.0	11.795
20	13 11 30.77	2.2962	3 12 54.8	11.764
21	13 13 48.50	2.2947	3 24 39.7	11.732
22	13 16 6.14	2.2932	3 36 22.7	11.699
23	13 18 23.69	2.2918	S. 3 48 3.6	11.664

SATURDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 20 41.16	2.2905	S. 3 59 42.4	11.629
1	13 22 58.55	2.2892	4 11 19.1	11.592
2	13 25 15.86	2.2879	4 22 53.5	11.554
3	13 27 33.10	2.2867	4 34 25.6	11.515
4	13 29 50.26	2.2854	4 45 55.3	11.475
5	13 32 7.35	2.2842	4 57 22.6	11.433
6	13 34 24.37	2.2831	5 8 47.3	11.390
7	13 36 41.32	2.2819	5 20 9.4	11.347
8	13 38 58.20	2.2808	5 31 28.9	11.303
9	13 41 15.02	2.2798	5 42 45.8	11.258
10	13 43 31.78	2.2788	5 53 59.9	11.211
11	13 45 48.48	2.2778	6 5 11.1	11.163
12	13 48 5.12	2.2768	6 16 19.4	11.114
13	13 50 21.70	2.2759	6 27 24.8	11.064
14	13 52 38.23	2.2750	6 38 27.1	11.013
15	13 54 54.70	2.2741	6 49 26.3	10.961
16	13 57 11.12	2.2732	7 0 22.4	10.908
17	13 59 27.49	2.2724	7 11 15.3	10.854
18	14 1 43.81	2.2716	7 22 4.9	10.798
19	14 4 0.08	2.2708	7 32 51.1	10.742
20	14 6 16.31	2.2701	7 43 34.0	10.686
21	14 8 32.50	2.2694	7 54 13.5	10.629
22	14 10 48.64	2.2688	8 4 49.5	10.570
23	14 13 4.75	2.2682	8 15 21.9	10.510
24	14 15 20.82	2.2675	S. 8 25 50.7	10.450

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 15 20.82	2.2675	S. 8 25 50.7	10.450
1	14 17 36.85	2.2669	8 36 15.9	10.388
2	14 19 52.85	2.2663	8 46 37.3	10.325
3	14 22 8.81	2.2657	8 56 54.9	10.262
4	14 24 24.74	2.2652	9 7 8.7	10.198
5	14 26 40.64	2.2647	9 17 18.7	10.133
6	14 28 56.50	2.2642	9 27 24.7	10.067
7	14 31 12.34	2.2637	9 37 26.7	10.000
8	14 33 28.15	2.2633	9 47 24.7	9.932
9	14 35 43.94	2.2630	9 57 18.6	9.864
10	14 37 59.71	2.2626	10 7 8.4	9.796
11	14 40 15.45	2.2621	10 16 54.1	9.727
12	14 42 31.16	2.2617	10 26 35.6	9.656
13	14 44 46.85	2.2614	10 36 12.8	9.584
14	14 47 2.53	2.2611	10 45 45.6	9.511
15	14 49 18.19	2.2608	10 55 14.1	9.438
16	14 51 33.83	2.2606	11 4 38.2	9.364
17	14 53 49.46	2.2603	11 13 57.8	9.289
18	14 56 5.07	2.2601	11 23 12.9	9.214
19	14 58 20.67	2.2598	11 32 23.5	9.138
20	15 0 36.25	2.2596	11 41 29.5	9.062
21	15 2 51.82	2.2594	11 50 30.9	8.984
22	15 5 7.38	2.2592	11 59 27.6	8.906
23	15 7 22.93	2.2591	S. 12 8 19.6	8.827

MONDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 9 38.47	2.2589	S. 12 17 6.9	8.748
1	15 11 54.00	2.2587	12 25 49.4	8.668
2	15 14 9.52	2.2586	12 34 27.0	8.587
3	15 16 25.03	2.2584	12 42 59.8	8.506
4	15 18 40.53	2.2583	12 51 27.7	8.424
5	15 20 56.03	2.2582	12 59 50.7	8.342
6	15 23 11.52	2.2582	13 8 8.7	8.258
7	15 25 27.01	2.2581	13 16 21.7	8.174
8	15 27 42.49	2.2579	13 24 29.6	8.090
9	15 29 57.96	2.2578	13 32 32.5	8.005
10	15 32 13.43	2.2577	13 40 30.2	7.919
11	15 34 28.89	2.2577	13 48 22.8	7.833
12	15 36 44.35	2.2576	13 56 10.2	7.746
13	15 38 59.80	2.2575	14 3 52.4	7.659
14	15 41 15.25	2.2575	14 11 29.3	7.572
15	15 43 30.70	2.2574	14 19 1.0	7.484
16	15 45 46.14	2.2573	14 26 27.4	7.395
17	15 48 1.58	2.2573	14 33 48.4	7.306
18	15 50 17.02	2.2572	14 41 4.1	7.217
19	15 52 32.45	2.2572	14 48 14.4	7.126
20	15 54 47.88	2.2572	14 55 19.2	7.035
21	15 57 3.31	2.2571	15 2 18.6	6.944
22	15 59 18.73	2.2569	15 9 12.5	6.853
23	16 1 34.14	2.2568	15 16 0.9	6.761
24	16 3 49.55	2.2568	S. 15 22 43.8	6.668

TUESDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 3 49.55	2.2568	S. 15 22 43.8	6.668
1	16 6 4.96	2.2567	15 29 21.1	6.575
2	16 8 20.36	2.2566	15 35 52.8	6.482
3	16 10 35.75	2.2565	15 42 18.9	6.388
4	16 12 51.14	2.2564	15 48 39.4	6.295
5	16 15 6.52	2.2562	15 54 54.3	6.201
6	16 17 21.89	2.2561	16 1 3.5	6.106
7	16 19 37.25	2.2560	16 7 7.0	6.011
8	16 21 52.61	2.2559	16 13 4.8	5.915
9	16 24 7.96	2.2557	16 18 56.8	5.819
10	16 26 23.30	2.2555	16 24 43.1	5.723
11	16 28 38.62	2.2553	16 30 23.6	5.627
12	16 30 53.93	2.2551	16 35 58.3	5.530
13	16 33 9.23	2.2549	16 41 27.2	5.433
14	16 35 24.52	2.2547	16 46 50.3	5.336
15	16 37 39.80	2.2545	16 52 7.5	5.238
16	16 39 55.06	2.2542	16 57 18.8	5.139
17	16 42 10.30	2.2539	17 2 24.2	5.042
18	16 44 25.53	2.2537	17 7 23.8	4.944
19	16 46 40.74	2.2534	17 12 17.5	4.845
20	16 48 55.93	2.2531	17 17 5.2	4.745
21	16 51 11.11	2.2527	17 21 46.9	4.646
22	16 53 26.26	2.2523	17 26 22.7	4.547
23	16 55 41.39	2.2520	S. 17 30 52.6	4.448

WEDNESDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	16 57 56.50	2.2516	S. 17 35 16.5	4.347
1	17 0 11.58	2.2512	17 39 34.3	4.247
2	17 2 26.64	2.2507	17 43 46.2	4.148
3	17 4 41.67	2.2502	17 47 52.1	4.048
4	17 6 56.67	2.2497	17 51 52.0	3.947
5	17 9 11.64	2.2493	17 55 45.8	3.847
6	17 11 26.59	2.2488	17 59 33.6	3.747
7	17 13 41.50	2.2483	18 3 15.4	3.646
8	17 15 56.38	2.2477	18 6 51.1	3.544
9	17 18 11.22	2.2470	18 10 20.7	3.443
10	17 20 26.02	2.2464	18 13 44.2	3.342
11	17 22 40.79	2.2458	18 17 1.7	3.241
12	17 24 55.52	2.2452	18 20 13.1	3.139
13	17 27 10.21	2.2444	18 23 18.4	3.038
14	17 29 24.85	2.2437	18 26 17.6	2.937
15	17 31 39.45	2.2429	18 29 10.8	2.836
16	17 33 54.00	2.2421	18 31 57.9	2.733
17	17 36 8.50	2.2414	18 34 38.8	2.631
18	17 38 22.96	2.2406	18 37 13.6	2.529
19	17 40 37.37	2.2397	18 39 42.3	2.427
20	17 42 51.72	2.2387	18 42 4.9	2.326
21	17 45 6.02	2.2378	18 44 21.4	2.225
22	17 47 20.26	2.2368	18 46 31.9	2.124
23	17 49 34.44	2.2359	18 48 36.3	2.022
24	17 51 48.57	2.2349	S. 18 50 34.6	1.921

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 51 48.57	2.2349	S. 18 50 34.6	1.921
1	17 54 2.63	2.2338	18 52 26.8	1.819
2	17 56 16.63	2.2328	18 54 12.9	1.717
3	17 58 30.57	2.2317	18 55 52.9	1.616
4	18 0 44.44	2.2306	18 57 26.8	1.514
5	18 2 58.24	2.2294	18 58 54.6	1.413
6	18 5 11.97	2.2282	19 0 16.4	1.312
7	18 7 25.63	2.2270	19 1 32.1	1.211
8	18 9 39.21	2.2258	19 2 41.7	1.110
9	18 11 52.72	2.2245	19 3 45.3	1.010
10	18 14 6.15	2.2232	19 4 42.9	0.909
11	18 16 19.50	2.2218	19 5 34.4	0.808
12	18 18 32.77	2.2205	19 6 19.9	0.708
13	18 20 45.96	2.2191	19 6 59.4	0.608
14	18 22 59.06	2.2177	19 7 32.9	0.507
15	18 25 12.08	2.2162	19 8 0.3	0.407
16	18 27 25.01	2.2147	19 8 21.7	0.307
17	18 29 37.85	2.2132	19 8 37.2	0.208
18	18 31 50.59	2.2116	19 8 46.7	0.108
19	18 34 3.24	2.2101	19 8 50.2	−0.009
20	18 36 15.80	2.2085	19 8 47.8	+0.089
21	18 38 28.26	2.2068	19 8 39.5	0.188
22	18 40 40.62	2.2052	19 8 25.2	0.286
23	18 42 52.88	2.2035	S. 19 8 5.1	0.384

FRIDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 45 5.04	2.2017	S. 19 7 39.1	0.483
1	18 47 17.09	2.2000	19 7 7.2	0.581
2	18 49 29.04	2.1982	19 6 29.4	0.678
3	18 51 40.88	2.1964	19 5 45.8	0.775
4	18 53 52.61	2.1945	19 4 56.4	0.872
5	18 56 4.22	2.1927	19 4 1.2	0.969
6	18 58 15.72	2.1907	19 3 0.1	1.066
7	19 0 27.11	2.1888	19 1 53.3	1.161
8	19 2 38.38	2.1868	19 0 40.8	1.257
9	19 4 49.53	2.1848	18 59 22.5	1.352
10	19 7 0.56	2.1828	18 57 58.5	1.447
11	19 9 11.47	2.1808	18 56 28.8	1.542
12	19 11 22.26	2.1787	18 54 53.4	1.637
13	19 13 32.92	2.1767	18 53 12.4	1.731
14	19 15 43.46	2.1746	18 51 25.7	1.825
15	19 17 53.87	2.1724	18 49 33.4	1.918
16	19 20 4.15	2.1702	18 47 35.5	2.011
17	19 22 14.30	2.1680	18 45 32.1	2.103
18	19 24 24.31	2.1658	18 43 23.1	2.196
19	19 26 34.19	2.1636	18 41 8.6	2.288
20	19 28 43.94	2.1613	18 38 48.6	2.379
21	19 30 53.55	2.1590	18 36 23.1	2.470
22	19 33 3.02	2.1567	18 33 52.2	2.561
23	19 35 12.35	2.1544	18 31 15.8	2.652
24	19 37 21.55	2.1521	S. 18 28 34.0	2.741

SATURDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 37 21.55	2.1521	S. 18 28 34.0	2.741
1	19 39 30.60	2.1497	18 25 46.9	2.830
2	19 41 39.51	2.1472	18 22 54.4	2.919
3	19 43 48.27	2.1448	18 19 56.6	3.008
4	19 45 56.89	2.1424	18 16 53.5	3.096
5	19 48 5.36	2.1400	18 13 45.1	3.183
6	19 50 13.69	2.1376	18 10 31.5	3.270
7	19 52 21.87	2.1350	18 7 12.7	3.357
8	19 54 29.89	2.1324	18 3 48.7	3.443
9	19 56 37.76	2.1299	18 0 19.5	3.529
10	19 58 45.48	2.1274	17 56 45.2	3.614
11	20 0 53.05	2.1249	17 53 5.8	3.698
12	20 3 0.47	2.1223	17 49 21.4	3.783
13	20 5 7.73	2.1197	17 45 31.9	3.867
14	20 7 14.83	2.1171	17 41 37.4	3.950
15	20 9 21.78	2.1145	17 37 37.9	4.033
16	20 11 28.57	2.1118	17 33 33.4	4.116
17	20 13 35.20	2.1092	17 29 24.0	4.197
18	20 15 41.68	2.1066	17 25 9.8	4.278
19	20 17 48.00	2.1040	17 20 50.7	4.358
20	20 19 54.16	2.1013	17 16 26.8	4.438
21	20 22 0.15	2.0985	17 11 58.1	4.518
22	20 24 5.98	2.0958	17 7 24.6	4.597
23	20 26 11.65	2.0932	S. 17 2 46.4	4.676

SUNDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	20 28 17.16	2.0904	S. 16 58 3.5	4.753
1	20 30 22.50	2.0877	16 53 16.0	4.831
2	20 32 27.68	2.0850	16 48 23.8	4.908
3	20 34 32.70	2.0822	16 43 27.0	4.984
4	20 36 37.55	2.0795	16 38 25.7	5.060
5	20 38 42.24	2.0768	16 33 19.8	5.136
6	20 40 46.77	2.0741	16 28 9.4	5.210
7	20 42 51.13	2.0713	16 22 54.6	5.284
8	20 44 55.32	2.0685	16 17 35.4	5.358
9	20 46 59.35	2.0657	16 12 11.7	5.431
10	20 49 3.21	2.0629	16 6 43.7	5.503
11	20 51 6.90	2.0602	16 1 11.4	5.574
12	20 53 10.43	2.0574	15 55 34.8	5.646
13	20 55 13.79	2.0547	15 49 53.9	5.717
14	20 57 16.99	2.0519	15 44 8.8	5.786
15	20 59 20.02	2.0491	15 38 19.6	5.855
16	21 1 22.88	2.0463	15 32 26.2	5.924
17	21 3 25.58	2.0436	15 26 28.7	5.992
18	21 5 28.11	2.0408	15 20 27.2	6.059
19	21 7 30.48	2.0381	15 14 21.6	6.126
20	21 9 32.68	2.0353	15 8 12.0	6.192
21	21 11 34.71	2.0325	15 1 58.5	6.258
22	21 13 36.58	2.0298	14 55 41.0	6.324
23	21 15 38.29	2.0271	14 49 19.6	6.388
24	21 17 39.83	2.0243	S. 14 42 54.4	6.452

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 17 39.83	2.0243	S. 14 42 54.4	6.452
1	21 19 41.21	2.0216	14 36 25.4	6.515
2	21 21 42.43	2.0189	14 29 52.6	6.578
3	21 23 43.48	2.0162	14 23 16.0	6.641
4	21 25 44.37	2.0135	14 16 35.7	6.702
5	21 27 45.10	2.0107	14 9 51.8	6.762
6	21 29 45.66	2.0080	14 3 4.2	6.823
7	21 31 46.06	2.0053	13 56 13.0	6.883
8	21 33 46.30	2.0027	13 49 18.3	6.941
9	21 35 46.39	2.0001	13 42 20.1	6.999
10	21 37 46.32	1.9975	13 35 18.4	7.057
11	21 39 46.09	1.9948	13 28 13.3	7.114
12	21 41 45.70	1.9922	13 21 4.7	7.171
13	21 43 45.16	1.9896	13 13 52.8	7.226
14	21 45 44.46	1.9870	13 6 37.6	7.282
15	21 47 43.60	1.9844	12 59 19.0	7.337
16	21 49 42.59	1.9819	12 51 57.2	7.390
17	21 51 41.43	1.9793	12 44 32.2	7.442
18	21 53 40.11	1.9767	12 37 4.1	7.495
19	21 55 38.64	1.9742	12 29 32.8	7.547
20	21 57 37.02	1.9717	12 21 58.4	7.599
21	21 59 35.25	1.9693	12 14 20.9	7.650
22	22 1 33.34	1.9669	12 6 40.4	7.700
23	22 3 31.28	1.9644	S. 11 58 56.9	7.750

TUESDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 5 29.07	1.9620	S. 11 51 10.4	7.799
1	22 7 26.72	1.9596	11 43 21.0	7.847
2	22 9 24.22	1.9572	11 35 28.8	7.894
3	22 11 21.58	1.9548	11 27 33.7	7.941
4	22 13 18.80	1.9525	11 19 35.8	7.987
5	22 15 15.88	1.9502	11 11 35.2	8.032
6	22 17 12.83	1.9480	11 3 31.9	8.077
7	22 19 9.64	1.9457	10 55 25.9	8.122
8	22 21 6.31	1.9433	10 47 17.2	8.167
9	22 23 2.84	1.9411	10 39 5.9	8.210
10	22 24 59.24	1.9389	10 30 52.0	8.252
11	22 26 55.51	1.9367	10 22 35.6	8.294
12	22 28 51.64	1.9344	10 14 16.7	8.336
13	22 30 47.64	1.9323	10 5 55.3	8.377
14	22 32 43.52	1.9303	9 57 31.5	8.416
15	22 34 39.28	1.9282	9 49 5.4	8.455
16	22 36 34.91	1.9262	9 40 36.9	8.494
17	22 38 30.42	1.9242	9 32 6.1	8.532
18	22 40 25.81	1.9222	9 23 33.1	8.569
19	22 42 21.08	1.9202	9 14 57.8	8.606
20	22 44 16.23	1.9182	9 6 20.3	8.642
21	22 46 11.26	1.9163	8 57 40.7	8.677
22	22 48 6.18	1.9144	8 48 59.0	8.712
23	22 50 0.99	1.9125	8 40 15.2	8.747
24	22 51 55.68	1.9106	S. 8 31 29.3	8.781

WEDNESDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 51 55.68	1.9106	S. 8 31 29.3	8.781
1	22 53 50.26	1.9088	8 22 41.4	8.814
2	22 55 44.74	1.9071	8 13 51.6	8.847
3	22 57 39.11	1.9053	8 4 59.8	8.879
4	22 59 33.38	1.9036	7 56 6.1	8.910
5	23 1 27.55	1.9019	7 47 10.6	8.940
6	23 3 21.61	1.9002	7 38 13.3	8.970
7	23 5 15.57	1.8986	7 29 14.2	9.000
8	23 7 9.44	1.8970	7 20 13.3	9.029
9	23 9 3.21	1.8954	7 11 10.7	9.057
10	23 10 56.89	1.8939	7 2 6.5	9.084
11	23 12 50.48	1.8924	6 53 0.6	9.111
12	23 14 43.98	1.8909	6 43 53.1	9.137
13	23 16 37.39	1.8895	6 34 44.1	9.163
14	23 18 30.72	1.8881	6 25 33.5	9.189
15	23 20 23.96	1.8867	6 16 21.4	9.213
16	23 22 17.12	1.8854	6 7 7.9	9.237
17	23 24 10.21	1.8841	5 57 53.0	9.261
18	23 26 3.22	1.8828	5 48 36.6	9.284
19	23 27 56.15	1.8816	5 39 18.9	9.306
20	23 29 49.01	1.8804	5 29 59.9	9.327
21	23 31 41.80	1.8793	5 20 39.7	9.347
22	23 33 34.52	1.8782	5 11 18.2	9.367
23	23 35 27.18	1.8771	S. 5 1 55.6	9.387

THURSDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 37 19.77	1.8760	S. 4 52 31.8	9.407
1	23 39 12.30	1.8750	4 43 6.8	9.425
2	23 41 4.77	1.8740	4 33 40.8	9.443
3	23 42 57.18	1.8730	4 24 13.7	9.460
4	23 44 49.53	1.8721	4 14 45.6	9.477
5	23 46 41.83	1.8712	4 5 16.5	9.492
6	23 48 34.08	1.8704	3 55 46.5	9.507
7	23 50 26.28	1.8696	3 46 15.6	9.522
8	23 52 18.43	1.8688	3 36 43.8	9.537
9	23 54 10.54	1.8682	3 27 11.1	9.551
10	23 56 2.61	1.8675	3 17 37.6	9.564
11	23 57 54.64	1.8668	3 8 3.4	9.577
12	23 59 46.63	1.8662	2 58 28.4	9.589
13	0 1 38.59	1.8657	2 48 52.7	9.600
14	0 3 30.51	1.8651	2 39 16.4	9.610
15	0 5 22.40	1.8646	2 29 39.5	9.621
16	0 7 14.26	1.8642	2 20 1.9	9.631
17	0 9 6.10	1.8637	2 10 23.8	9.639
18	0 10 57.91	1.8633	2 0 45.2	9.648
19	0 12 49.70	1.8630	1 51 6.1	9.656
20	0 14 41.47	1.8627	1 41 26.5	9.663
21	0 16 33.23	1.8625	1 31 46.5	9.670
22	0 18 24.97	1.8622	1 22 6.1	9.676
23	0 20 16.70	1.8621	1 12 25.4	9.681
24	0 22 8.42	1.8620	S. 1 2 44.4	9.686

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 25.					SUNDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 22 8.42	1.8620	S. 1 2 44.4	9.686	0	1 52 9.82	1.9056	N. 6 36 51.3	9.240
1	0 24 0.14	1.8619	0 53 3.1	9.690	1	1 54 4.21	1.9075	6 46 5.0	9.216
2	0 25 51.85	1.8618	0 43 21.6	9.693	2	1 55 58.72	1.9095	6 55 17.2	9.191
3	0 27 43.56	1.8618	0 33 39.9	9.697	3	1 57 53.35	1.9116	7 4 27.9	9.166
4	0 29 35.27	1.8618	0 23 58 0	9.700	4	1 59 48.11	1.9137	7 13 37.1	9.141
5	0 31 26.98	1.8619	0 14 15.9	9.702	5	2 1 43.00	1.9159	7 22 44.8	9.115
6	0 33 18.70	1.8620	S. 0 4 33.7	9.703	6	2 3 38.02	1.9181	7 31 50.9	9.088
7	0 35 10.42	1.8621	N. 0 5 8.5	9.704	7	2 5 33.17	1.9203	7 40 55.4	9.061
8	0 37 2.15	1.8623	0 14 50.8	9.705	8	2 7 28.46	1.9226	7 49 58.2	9.033
9	0 38 53.90	1.8627	0 24 33.1	9.704	9	2 9 23.88	1.9248	7 58 59.3	9.004
10	0 40 45.67	1.8630	0 34 15.3	9.703	10	2 11 19.44	1.9272	8 7 58.7	8.975
11	0 42 37.46	1.8633	0 43 57.5	9.702	11	2 13 15.15	1.9297	8 16 56.3	8.945
12	0 44 29.27	1.8637	0 53 39.6	9.700	12	2 15 11.00	1.9321	8 25 52.1	8.915
13	0 46 21.10	1.8641	1 3 21.5	9.697	13	2 17 7.00	1.9346	8 34 46.1	8.884
14	0 48 12.96	1.8645	1 13 3.2	9.693	14	2 19 3.15	1.9371	8 43 38.2	8.852
15	0 50 4.84	1.8649	1 22 44.7	9.690	15	2 20 59.45	1.9397	8 52 28.3	8.819
16	0 51 56.75	1.8655	1 32 26.0	9.687	16	2 22 55.91	1.9423	9 1 16.5	8.786
17	0 53 48.70	1.8661	1 42 7.1	9.683	17	2 24 52.53	1.9450	9 10 2.6	8.752
18	0 55 40.68	1.8667	1 51 47.9	9.677	18	2 26 49.31	1.9477	9 18 46.7	8.718
19	0 57 32.70	1.8673	2 1 28.3	9.670	19	2 28 46.25	1.9504	9 27 28.7	8.683
20	0 59 24.76	1.8681	2 11 8.3	9.662	20	2 30 43.36	1.9532	9 36 8.6	8.648
21	1 1 16.87	1.8688	2 20 47.8	9.655	21	2 32 40.63	1.9560	9 44 46.4	8.612
22	1 3 9.02	1.8696	2 30 26.9	9.647	22	2 34 38.08	1.9589	9 53 22.0	8.574
23	1 5 1.22	1.8705	N. 2 40 5.5	9.640	23	2 36 35.70	1.9618	N.10 1 55.3	8.536
	SATURDAY 26.					MONDAY 28.			
0	1 6 53.48	1.8714	N. 2 49 43.7	9.632	0	2 38 33.49	1.9647	N.10 10 26.3	8.496
1	1 8 45.79	1.8723	2 59 21.3	9.622	1	2 40 31.46	1.9677	10 18 55.0	8.459
2	1 10 38.16	1.8732	3 8 58.3	9.611	2	2 42 29.62	1.9708	10 27 21.4	8.420
3	1 12 30.58	1.8742	3 18 34.6	9.600	3	2 44 27.96	1.9738	10 35 45.4	8.379
4	1 14 23.06	1.8753	3 28 10.3	9.589	4	2 46 26.48	1.9769	10 44 6.9	8.338
5	1 16 15.61	1.8764	3 37 45.3	9.577	5	2 48 25.19	1.9801	10 52 25.9	8.297
6	1 18 8.23	1.8776	3 47 19.5	9.564	6	2 50 24.09	1.9832	11 0 42.5	8.255
7	1 20 0.92	1.8787	3 56 53.0	9.551	7	2 52 23.18	1.9865	11 8 56.5	8.212
8	1 21 53.68	1.8799	4 6 25.7	9.538	8	2 54 22.47	1.9897	11 17 7.9	8.168
9	1 23 46.51	1.8812	4 15 57.6	9.524	9	2 56 21.95	1.9930	11 25 16.7	8.124
10	1 25 39.42	1.8825	4 25 28.6	9.509	10	2 58 21.63	1.9964	11 33 22.8	8.079
11	1 27 32.41	1.8839	4 34 58.7	9.493	11	3 0 21.52	1.9998	11 41 26.2	8.033
12	1 29 25.49	1.8853	4 44 27.8	9.478	12	3 2 21.61	2.0032	11 49 26.8	7.987
13	1 31 18.65	1.8867	4 53 56.0	9.462	13	3 4 21.91	2.0067	11 57 24.6	7.940
14	1 33 11.90	1.8882	5 3 23.2	9.444	14	3 6 22.41	2.0101	12 5 19.6	7.892
15	1 35 5.24	1.8897	5 12 49.3	9.426	15	3 8 23.12	2.0137	12 13 11.7	7.843
16	1 36 58.67	1.8913	5 22 14.3	9.408	16	3 10 24.05	2.0172	12 21 0.8	7.794
17	1 38 52.20	1.8930	5 31 38.2	9.389	17	3 12 25.19	2.0208	12 28 47.0	7.745
18	1 40 45.83	1.8947	5 41 1.0	9.370	18	3 14 26.55	2.0245	12 36 30.2	7.694
19	1 42 39.56	1.8963	5 50 22.6	9.349	19	3 16 28.13	2.0282	12 44 10.3	7.643
20	1 44 33.39	1.8981	5 59 42.9	9.328	20	3 18 29.93	2.0318	12 51 47.3	7.591
21	1 46 27.33	1.8999	6 9 2.0	9.307	21	3 20 31.95	2.0356	12 59 21.2	7.538
22	1 48 21.38	1.9018	6 18 19.8	9.285	22	3 22 34.20	2.0394	13 6 51.9	7.484
23	1 50 15.54	1.9037	6 27 36.2	9.263	23	3 24 36.68	2.0432	13 14 19.3	7.430
24	1 52 9.82	1.9056	N. 6 36 51.3	9.240	24	3 26 39.38	2.0469	N.13 21 43.5	7.376

GREENWICH MEAN TIME.

PHASES OF THE MOON.

		d	h	m
○ Full Moon	Feb.	7	22	14.1
☾ Last Quarter		14	13	32.0
● New Moon		22	9	40.3

		d	h
☾ Perigee	Feb.	9	0.3
☾ Apogee		24	6.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Sun	W.	91° 40′ 28″	3253	93° 5′ 34″	3238	94° 30′ 58″	3223	95° 56′ 40″	3208
	Fomalhaut	W.	71 10 42	3203	72 36 48	3184	74 3 16	3166	75 30 6	3147
	α Pegasi	W.	56 50 57	3334	58 14 29	3306	59 38 34	3277	61 3 12	3250
	Saturn	E.	63 19 5	2866	61 46 3	2853	60 12 44	2839	58 39 7	2826
	Pollux	E.	68 30 32	2956	66 59 24	2945	65 28 2	2932	63 56 24	2920
	Regulus	E.	104 12 3	2882	102 39 21	2868	101 6 21	2854	99 33 3	2840
2	Sun	W.	103 9 56	3124	104 37 37	3106	106 5 39	3087	107 34 4	3069
	Fomalhaut	W.	82 49 54	3056	84 18 58	3037	85 48 25	3019	87 18 14	3001
	α Pegasi	W.	68 14 2	3125	69 41 41	3101	71 9 49	3078	72 38 25	3055
	α Arietis	W.	25 30 5	3660	26 47 35	3551	28 7 3	3454	29 28 19	3367
	Saturn	E.	50 46 27	2752	49 10 56	2736	47 35 4	2720	45 58 51	2704
	Pollux	E.	56 14 19	2858	54 41 6	2845	53 7 36	2832	51 33 50	2821
	Regulus	E.	91 41 47	2763	90 6 31	2747	88 30 53	2729	86 54 52	2713
3	Sun	W.	115 1 55	2973	116 32 41	2953	118 3 53	2933	119 35 30	2912
	Fomalhaut	W.	94 52 47	2916	96 24 46	2899	97 57 6	2883	99 29 47	2867
	α Pegasi	W.	80 8 26	2945	81 39 48	2924	83 11 37	2903	84 43 52	2883
	α Arietis	W.	36 36 18	3052	38 5 27	3003	39 35 36	2958	41 6 42	2915
	Saturn	E.	37 52 21	2622	36 13 56	2606	34 35 9	2589	32 55 59	2573
	Pollux	E.	43 41 10	2764	42 5 55	2755	40 30 28	2747	38 54 50	2741
	Regulus	E.	78 49 4	2624	77 10 42	2606	75 31 55	2587	73 52 42	2569
4	Sun	W.	127 20 6	2811	128 54 20	2790	130 29 1	2769	132 4 9	2749
	Fomalhaut	W.	107 18 5	2795	108 52 39	2783	110 27 29	2772	112 2 34	2761
	α Pegasi	W.	92 31 28	2788	94 6 12	2769	95 41 20	2753	97 16 50	2736
	α Arietis	W.	48 54 50	2734	50 30 45	2703	52 7 21	2673	53 44 37	2644
	Regulus	E.	65 30 11	2474	63 48 21	2455	62 6 5	2436	60 23 22	2417
	Spica	E.	119 2 27	2509	117 21 26	2488	115 39 56	2468	113 57 58	2449
5	α Arietis	W.	62 0 24	2513	63 41 19	2489	65 22 47	2467	67 4 47	2445
	Aldebaran	W.	28 25 29	2325	30 10 52	2307	31 56 41	2289	33 42 56	2272
	Regulus	E.	51 43 6	2325	49 57 43	2307	48 11 54	2289	46 25 39	2272
	Spica	E.	105 21 16	2353	103 36 34	2335	101 51 25	2317	100 5 50	2300
6	α Arietis	W.	75 42 10	2347	77 27 1	2330	79 12 17	2314	80 57 56	2298
	Aldebaran	W.	42 40 25	2191	44 29 6	2176	46 18 10	2161	48 7 36	2147
	Regulus	E.	37 28 12	2190	35 39 30	2176	33 50 26	2162	32 1 1	2148
	Spica	E.	91 11 40	2217	89 23 38	2202	87 35 14	2188	85 46 28	2174
	Jupiter	E.	104 41 44	2212	102 53 34	2196	101 5 1	2182	99 16 6	2168
7	α Arietis	W.	89 51 32	2233	91 39 10	2223	93 27 3	2214	95 15 10	2206
	Aldebaran	W.	57 19 49	2085	59 11 11	2075	61 2 49	2065	62 54 42	2057
	Saturn	W.	18 48 48	2134	20 38 56	2113	22 29 36	2094	24 20 44	2079
	Spica	E.	76 37 42	2114	74 47 4	2104	72 56 11	2095	71 5 4	2086
	Jupiter	E.	90 6 25	2105	88 15 33	2094	86 24 25	2085	84 33 2	2075
	Antares	E.	122 16 20	2173	120 27 12	2159	118 37 43	2147	116 47 55	2134
8	α Arietis	W.	104 18 20	2180	106 7 18	2178	107 56 19	2178	109 45 20	2178
	Aldebaran	W.	72 17 17	2021	74 10 19	2016	76 3 29	2012	77 56 45	2009
	Saturn	W.	33 41 28	2026	35 34 22	2019	37 27 26	2014	39 20 39	2009
	Pollux	W.	29 41 37	2278	31 28 9	2247	33 15 26	2221	35 3 22	2196

GREENWICH MEAN TIME.

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Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
1	SUN	W.	97° 22′ 40″	3192	98° 48′ 59″	3175	100° 15′ 38″	3158	101° 42′ 37″	3142
	Fomalhaut	W.	76 57 19	3129	78 24 54	3110	79 52 52	3091	81 21 12	3073
	α Pegasi	W.	62 28 22	3225	63 54 2	3199	65 20 12	3174	66 46 52	3149
	SATURN	E.	57 5 13	2811	55 31 0	2798	53 56 29	2782	52 21 38	2767
	Pollux	E.	62 24 31	2908	60 52 22	2895	59 19 57	2883	57 47 16	2870
	Regulus	E.	97 59 27	2825	96 25 32	2810	94 51 17	2795	93 16 42	2779
2	SUN	W.	109 2 51	3051	110 32 1	3031	112 1 35	3012	113 31 33	2993
	Fomalhaut	W.	88 48 25	2984	90 18 58	2966	91 49 53	2950	93 21 9	2932
	α Pegasi	W.	74 7 30	3032	75 37 3	3010	77 7 3	2988	78 37 31	2966
	α Arietis	W.	30 51 13	3291	32 15 35	3223	33 41 17	3161	35 8 13	3104
	SATURN	E.	44 22 17	2688	42 45 21	2672	41 8 3	2655	39 30 23	2639
	Pollux	E.	49 59 49	2808	48 25 32	2796	46 50 59	2785	45 16 12	2774
	Regulus	E.	85 18 29	2695	83 41 43	2678	82 4 34	2660	80 27 1	2643
3	SUN	W.	121 7 33	2892	122 40 2	2872	124 12 57	2852	125 46 18	2831
	Fomalhaut	W.	101 2 48	2852	102 36 9	2837	104 9 49	2822	105 43 48	2808
	α Pegasi	W.	86 16 33	2862	87 49 40	2843	89 23 12	2825	90 57 8	2806
	α Arietis	W.	42 38 42	2875	44 11 33	2838	45 45 12	2801	47 19 38	2766
	SATURN	E.	31 16 27	2557	29 36 33	2541	27 56 17	2526	26 15 40	2512
	Pollux	E.	37 19 4	2735	35 43 11	2732	34 7 14	2731	32 31 15	2733
	Regulus	E.	72 13 4	2550	70 33 0	2531	68 52 30	2512	67 11 34	2493
4	SUN	W.	133 39 44	2729	135 15 46	2709	136 52 14	2689	138 29 9	2669
	Fomalhaut	W.	113 37 53	2751	115 13 25	2743	116 49 8	2736	118 25 0	2730
	α Pegasi	W.	98 52 42	2720	100 28 55	2705	102 5 28	2691	103 42 20	2678
	α Arietis	W.	55 22 32	2616	57 1 5	2588	58 40 16	2562	60 20 3	2538
	Regulus	E.	58 40 12	2398	56 56 35	2380	55 12 32	2362	53 28 2	2344
	Spica	E.	112 15 33	2429	110 32 40	2410	108 49 19	2391	107 5 31	2372
5	α Arietis	W.	68 47 17	2424	70 30 17	2403	72 13 47	2384	73 57 45	2365
	Aldebaran	W.	35 29 36	2256	37 16 44	2239	39 4 11	2222	40 52 6	2206
	Regulus	E.	44 38 59	2256	42 51 54	2239	41 4 24	2223	39 16 30	2206
	Spica	E.	98 19 50	2283	96 33 25	2265	94 46 34	2249	92 59 19	2233
6	α Arietis	W.	82 43 58	2283	84 30 22	2269	86 17 7	2256	88 4 11	2245
	Aldebaran	W.	49 57 23	2134	51 47 31	2121	53 37 58	2109	55 28 44	2096
	Regulus	E.	30 11 15	2134	28 21 8	2121	26 30 41	2109	24 39 56	2098
	Spica	E.	83 57 21	2161	82 7 54	2148	80 18 8	2136	78 28 4	2124
	JUPITER	E.	97 26 50	2154	95 37 13	2141	93 47 16	2128	91 57 0	2116
7	α Arietis	W.	97 3 29	2198	98 52 0	2192	100 40 40	2187	102 29 27	2183
	Aldebaran	W.	64 46 48	2048	66 39 7	2040	68 31 39	2032	70 24 23	2026
	SATURN	W.	26 12 16	2065	28 4 9	2053	29 56 20	2043	31 48 47	2034
	Spica	E.	69 13 43	2078	67 22 10	2072	65 30 27	2066	63 38 35	2060
	JUPITER	E.	82 41 25	2067	80 49 35	2059	78 57 32	2052	77 5 18	2046
	Antares	E.	114 57 48	2124	113 7 25	2114	111 16 47	2105	109 25 55	2097
8	α Arietis	W.	111 34 21	2180	113 23 19	2183	115 12 12	2188	117 0 58	2194
	Aldebaran	W.	79 50 6	2005	81 43 32	2003	83 37 1	2003	85 30 31	2003
	SATURN	W.	41 14 0	2005	43 7 27	2001	45 0 59	2000	46 54 34	1999
	Pollux	W.	36 51 52	2180	38 40 50	2164	40 30 11	2151	42 19 52	2141

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Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
8	Spica	E.	61° 46′ 34″	2055	59° 54′ 26″	2052	58° 2′ 13″	2050	56° 9′ 56″	2048
	Jupiter	E.	75 12 55	2040	73 20 23	2035	71 27 43	2031	69 34 57	2028
	Antares	E.	107 34 51	2090	105 43 36	2084	103 52 12	2079	102 0 40	2074
9	Aldebaran	W.	87 24 1	2003	89 17 30	2004	91 10 58	2005	93 4 24	2008
	Saturn	W.	48 48 10	1998	50 41 47	1999	52 35 23	2000	54 28 58	2002
	Pollux	W.	44 9 49	2132	45 59 59	2125	47 50 20	2120	49 40 49	2116
	Spica	E.	46 48 23	2055	44 56 14	2059	43 4 12	2065	41 12 19	2073
	Jupiter	E.	60 10 15	2023	58 17 17	2025	56 24 21	2027	54 31 29	2030
	Antares	E.	92 41 46	2066	90 49 54	2067	88 58 4	2070	87 6 18	2073
10	Aldebaran	W.	102 30 8	2032	104 22 52	2039	106 15 26	2046	108 7 49	2054
	Saturn	W.	63 55 36	2024	65 48 33	2030	67 41 20	2037	69 33 56	2046
	Pollux	W.	58 53 54	2118	60 44 26	2121	62 34 53	2126	64 25 13	2132
	Regulus	W.	22 21 55	2033	24 14 38	2039	26 7 11	2046	27 59 33	2055
	Jupiter	E.	45 8 46	2057	43 16 41	2065	41 24 48	2074	39 33 9	2083
	Antares	E.	77 48 58	2099	75 57 57	2107	74 7 8	2115	72 16 32	2125
11	Saturn	W.	78 53 35	2093	80 44 45	2104	82 35 38	2115	84 26 14	2127
	Pollux	W.	73 34 21	2171	75 23 32	2180	77 12 29	2191	79 1 10	2202
	Regulus	W.	37 18 1	2103	39 8 56	2113	40 59 35	2125	42 49 56	2137
	Jupiter	E.	30 18 58	2145	28 29 7	2160	26 39 39	2176	24 50 36	2195
	Antares	E.	63 7 31	2184	61 18 39	2197	59 30 7	2212	57 41 58	2228
	α Aquilæ	E.	109 38 27	2657	108 0 50	2657	106 23 12	2658	104 45 36	2562
	Sun	E.	136 54 27	2408	135 11 4	2420	133 27 58	2433	131 45 10	2445
12	Saturn	W.	93 34 28	2192	95 23 7	2207	97 11 24	2221	98 59 20	2236
	Pollux	W.	88 0 7	2266	89 46 56	2280	91 33 25	2294	93 19 33	2309
	Regulus	W.	51 56 58	2202	53 45 22	2216	55 33 25	2231	57 21 7	2245
	Antares	E.	48 47 24	2319	47 1 52	2340	45 16 51	2362	43 32 22	2386
	α Aquilæ	E.	96 39 21	2698	95 2 39	2710	93 26 12	2722	91 50 1	2736
	Sun	E.	123 15 54	2516	121 35 3	2531	119 54 33	2545	118 14 23	2561
13	Pollux	W.	102 4 40	2387	103 48 33	2404	105 32 2	2420	107 15 8	2437
	Regulus	W.	66 14 9	2320	67 59 39	2335	69 44 47	2351	71 29 32	2366
	Antares	E.	34 59 4	2528	33 18 30	2564	31 38 46	2604	29 59 56	2647
	α Aquilæ	E.	83 54 5	2819	82 20 2	2838	80 46 24	2859	79 13 12	2880
	Sun	E.	109 59 4	2643	108 21 7	2659	106 43 32	2675	105 6 19	2692
14	Regulus	W.	80 7 45	2443	81 50 18	2459	83 32 29	2474	85 14 19	2489
	Spica	W.	27 5 34	2568	28 45 13	2570	30 24 49	2574	32 4 19	2580
	α Aquilæ	E.	71 34 25	3001	70 4 14	3030	68 34 38	3058	67 5 37	3087
	Sun	E.	97 5 46	2775	95 30 45	2792	93 56 6	2808	92 21 49	2825
15	Regulus	W.	93 38 15	2563	95 18 1	2577	96 57 28	2591	98 36 36	2604
	Spica	W.	40 19 16	2624	41 57 38	2635	43 35 46	2646	45 13 39	2657
	Jupiter	W.	26 21 27	2607	28 0 12	2617	29 38 44	2627	31 17 2	2638
	α Aquilæ	E.	59 50 9	3259	58 25 10	3299	57 0 57	3341	55 37 33	3385
	Sun	E.	84 35 34	2903	83 3 19	2919	81 31 24	2935	79 59 49	2950
16	Regulus	W.	106 47 36	2671	108 24 55	2683	110 1 57	2695	111 38 43	2708
	Spica	W.	53 19 23	2711	54 55 48	2722	56 31 58	2733	58 7 54	2744

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Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
8	Spica	E.	54° 17′ 36″	2047	52° 25′ 15″	2048	50° 32′ 55″	2049	48° 40′ 37″	2052
	JUPITER	E.	67 42 6	2025	65 49 11	2023	63 56 13	2023	62 3 14	2023
	Antares	E.	100 9 1	2071	98 17 17	2068	96 25 29	2066	94 33 38	2066
9	Aldebaran	W.	94 57 46	2012	96 51 2	2016	98 44 12	2021	100 37 14	2026
	SATURN	W.	56 22 29	2005	58 15 55	2008	60 9 16	2013	62 2 30	2018
	Pollux	W.	51 31 23	2114	53 22 0	2113	55 12 39	2113	57 3 18	2115
	Spica	E.	39 20 38	2082	37 29 11	2092	35 37 59	2103	33 47 5	2118
	JUPITER	E.	52 38 42	2034	50 46 1	2039	48 53 27	2044	47 1 2	2050
	Antares	E.	85 14 37	2076	83 23 1	2080	81 31 31	2086	79 40 10	2092
10	Aldebaran	W.	109 59 59	2062	111 51 56	2072	113 43 39	2081	115 35 7	2091
	SATURN	W.	71 26 19	2054	73 18 29	2062	75 10 26	2072	77 2 8	2082
	Pollux	W.	66 15 24	2138	68 5 25	2145	69 55 16	2153	71 44 55	2161
	Regulus	W.	29 51 42	2063	31 43 38	2072	33 35 21	2081	35 26 49	2092
	JUPITER	E.	37 41 44	2094	35 50 35	2105	33 59 44	2117	32 9 11	2130
	Antares	E.	70 26 11	2135	68 36 5	2145	66 46 15	2157	64 56 43	2170
11	SATURN	W.	86 16 32	2139	88 6 31	2153	89 56 10	2166	91 45 29	2179
	Pollux	W.	80 49 34	2214	82 37 40	2227	84 25 28	2239	86 12 57	2252
	Regulus	W.	44 39 59	2149	46 29 43	2162	48 19 8	2175	50 8 13	2188
	JUPITER	E.	23 2 1	2216	21 13 57	2239	19 26 27	2266	17 39 37	2299
	Antares	E.	55 54 12	2244	54 6 50	2262	52 19 54	2280	50 33 25	2299
	α Aquilæ	E.	103 8 5	2666	101 30 40	2672	99 53 23	2680	98 16 16	2689
	SUN	E.	130 2 40	2459	128 20 29	2472	126 38 37	2487	124 57 5	2502
12	SATURN	W.	100 46 54	2251	102 34 6	2266	104 20 56	2281	106 7 24	2296
	Pollux	W.	95 5 19	2324	96 50 43	2339	98 35 45	2355	100 20 24	2371
	Regulus	W.	59 8 27	2260	60 55 25	2274	62 42 2	2289	64 28 17	2305
	Antares	E.	41 48 27	2411	40 5 8	2437	38 22 26	2465	36 40 24	2495
	α Aquilæ	E.	90 14 9	2750	88 38 36	2766	87 3 23	2782	85 28 32	2801
	SUN	E.	116 34 35	2577	114 55 9	2593	113 16 5	2610	111 37 23	2626
13	Pollux	W.	108 57 50	2454	110 40 8	2471	112 22 2	2489	114 3 31	2506
	Regulus	W.	73 13 55	2382	74 57 56	2398	76 41 34	2413	78 24 50	2428
	Antares	E.	28 22 5	2696	26 45 20	2751	25 9 48	2815	23 35 40	2891
	α Aquilæ	E.	77 40 27	2902	76 8 11	2926	74 36 25	2950	73 5 9	2975
	SUN	E.	103 29 28	2708	101 52 59	2725	100 16 53	2742	98 41 9	2758
14	Regulus	W.	86 55 48	2504	88 36 56	2519	90 17 43	2534	91 58 9	2548
	Spica	W.	33 43 41	2588	35 22 53	2596	37 1 53	2605	38 40 41	2615
	α Aquilæ	E.	65 37 12	3119	64 9 25	3152	62 42 18	3186	61 15 52	3222
	SUN	E.	90 47 53	2840	89 14 17	2856	87 41 2	2873	86 8 8	2888
15	Regulus	W.	100 15 25	2618	101 53 55	2632	103 32 6	2645	105 10 0	2658
	Spica	W.	46 51 17	2667	48 28 41	2678	50 5 50	2689	51 42 44	2701
	JUPITER	W.	32 55 5	2649	34 32 53	2660	36 10 26	2672	37 47 44	2683
	α Aquilæ	E.	54 14 59	3431	52 53 18	3481	51 32 33	3535	50 12 47	3590
	SUN	E.	78 28 33	2961	76 57 35	2978	75 26 55	2993	73 56 33	3007
16	Regulus	W.	113 15 12	2720	114 51 25	2731	116 27 23	2742	118 3 7	2753
	Spica	W.	59 43 35	2755	61 19 2	2766	62 54 15	2775	64 29 15	2786

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16	Jupiter	W.	39° 24′ 47″	2694	41° 1′ 35″	2705	42° 38′ 8″	2716	44° 14′ 26″	2728
	α Aquilæ	E.	48 54 2	3650	47 36 22	3716	46 19 52	3787	45 4 36	3862
	Sun	E.	72 26 29	3021	70 56 42	3034	69 27 12	3047	67 57 58	3060
17	Spica	W.	66 4 1	2796	67 38 34	2806	69 12 54	2816	70 47 1	2826
	Jupiter	W.	52 12 21	2780	53 47 15	2790	55 21 56	2800	56 56 24	2810
	Antares	W.	21 51 31	3239	23 16 54	3192	24 43 13	3154	26 10 17	3125
	Sun	E.	60 35 44	3122	59 8 1	3134	57 40 33	3145	56 13 18	3157
18	Spica	W.	78 34 33	2871	80 7 29	2880	81 40 14	2888	83 12 48	2897
	Jupiter	W.	64 45 40	2855	66 18 57	2863	67 52 3	2872	69 24 58	2880
	Antares	W.	33 32 16	3050	35 1 27	3043	36 30 46	3039	38 0 10	3036
	Sun	E.	49 0 19	3208	47 34 19	3218	46 8 31	3227	44 42 54	3236
19	Spica	W.	90 53 5	2935	92 24 39	2942	93 56 4	2949	95 27 21	2956
	Jupiter	W.	77 7 5	2917	78 39 2	2924	80 10 50	2931	81 42 30	2938
	Antares	W.	45 27 52	3031	46 57 26	3033	48 26 58	3034	49 56 28	3037
	Sun	E.	37 37 26	3278	36 12 49	3287	34 48 22	3294	33 24 4	3301
20	Spica	W.	103 1 36	2989	104 32 3	2995	106 2 22	3001	107 32 33	3007
	Jupiter	W.	89 18 48	2968	90 49 41	2973	92 20 27	2979	93 51 6	2985
	Antares	W.	57 23 17	3049	58 52 29	3052	60 21 37	3056	61 50 41	3058
	Sun	E.	26 24 37	3336	25 1 7	3343	23 37 45	3349	22 14 30	3354
24	Sun	W.	17 24 25	3459	18 45 35	3460	20 6 44	3461	21 27 52	3461
	α Arietis	E.	44 43 9	3391	43 20 42	3409	41 58 36	3431	40 36 54	3453
	Aldebaran	E.	75 12 15	3073	73 43 32	3074	72 14 51	3074	70 46 10	3075
	Saturn	E.	113 5 44	3069	111 36 56	3069	110 8 9	3069	108 39 22	3070
25	Sun	W.	28 13 31	3460	29 34 40	3459	30 55 50	3457	32 17 2	3455
	Aldebaran	E.	63 22 52	3074	61 54 11	3073	60 25 29	3073	58 56 46	3072
	Saturn	E.	101 15 32	3069	99 46 45	3069	98 17 57	3068	96 49 8	3066
	Pollux	E.	107 14 2	3144	105 46 46	3143	104 19 28	3140	102 52 7	3138
26	Sun	W.	39 3 33	3444	40 25 0	3441	41 46 30	3437	43 8 5	3433
	Venus	W.	18 46 31	3547	20 6 3	3543	21 25 40	3538	22 45 22	3534
	Aldebaran	E.	51 32 41	3061	50 3 44	3058	48 34 43	3055	47 5 38	3051
	Saturn	E.	89 24 32	3056	87 55 28	3053	86 26 21	3050	84 57 10	3047
	Pollux	E.	95 34 39	3125	94 7 0	3122	92 39 17	3119	91 11 30	3114
27	Sun	W.	49 57 12	3408	51 19 19	3402	52 41 33	3395	54 3 55	3389
	Venus	W.	29 25 15	3506	30 45 33	3499	32 5 58	3492	33 26 31	3486
	Aldebaran	E.	39 38 57	3028	38 9 19	3023	36 39 35	3017	35 9 43	3010
	Saturn	E.	77 30 5	3025	76 0 23	3019	74 30 34	3014	73 0 38	3007
	Pollux	E.	83 51 20	3093	82 23 2	3087	80 54 37	3082	79 26 6	3077
28	Sun	W.	60 57 49	3348	62 21 5	3339	63 44 31	3329	65 8 9	3319
	Venus	W.	40 11 22	3444	41 32 49	3434	42 54 27	3423	44 16 17	3413
	Aldebaran	E.	27 38 17	2974	26 7 32	2965	24 36 36	2956	23 5 28	2946
	Saturn	E.	65 28 56	2972	63 58 8	2964	62 27 10	2956	60 56 2	2946
	Pollux	E.	72 1 39	3045	70 32 22	3038	69 2 56	3030	67 33 20	3022
	Regulus	E.	107 46 44	2974	106 15 59	2965	104 45 3	2956	103 13 55	2946

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16	Jupiter	W.	45° 50′ 29″	2738	47° 26′ 18″	2749	49° 1′ 53″	2760	50° 37′ 14″	2770
	α Aquilæ	E.	43 50 38	3944	42 38 3	4033	41 26 56	4131	40 17 24	4239
	Sun	E.	66 29 0	3073	65 0 18	3087	63 31 52	3099	62 3 41	3110
17	Spica	W.	72 20 55	2835	73 54 37	2845	75 28 7	2853	77 1 26	2862
	Jupiter	W.	58 30 39	2819	60 4 42	2828	61 38 33	2838	63 12 12	2846
	Antares	W.	27 37 56	3103	29 6 2	3085	30 34 30	3070	32 3 16	3059
	Sun	E.	54 46 17	3168	53 19 29	3178	51 52 53	3188	50 26 30	3198
18	Spica	W.	84 45 11	2905	86 17 24	2912	87 49 27	2920	89 21 21	2927
	Jupiter	W.	70 57 43	2887	72 30 18	2895	74 2 43	2902	75 34 59	2910
	Antares	W.	39 29 38	3034	40 59 9	3032	42 28 42	3030	43 58 17	3030
	Sun	E.	43 17 28	3245	41 52 12	3254	40 27 7	3263	39 2 12	3270
19	Spica	W.	96 58 29	2962	98 29 29	2969	100 0 20	2977	101 31 2	2983
	Jupiter	W.	83 14 1	2944	84 45 24	2950	86 16 40	2956	87 47 48	2962
	Antares	W.	51 25 55	3039	52 55 20	3041	54 24 42	3043	55 54 1	3046
	Sun	E.	31 59 54	3309	30 35 53	3316	29 12 0	3323	27 48 15	3329
20	Spica	W.	109 2 37	3013	110 32 34	3018	112 2 24	3024	113 32 7	3030
	Jupiter	W.	95 21 38	2989	96 52 4	2994	98 22 24	3000	99 52 37	3005
	Antares	W.	63 19 42	3061	64 48 39	3065	66 17 32	3069	67 46 20	3072
	Sun	E.	20 51 21	3361	19 28 20	3367	18 5 26	3372	16 42 38	3378
24	Sun	W.	22 49 0	3462	24 10 7	3462	25 31 14	3461	26 52 22	3460
	α Arietis	E.	39 15 37	3478	37 54 48	3506	36 34 30	3536	35 14 46	3571
	Aldebaran	E.	69 17 30	3075	67 48 50	3076	66 20 11	3076	64 51 32	3075
	Saturn	E.	107 10 36	3070	105 41 50	3070	104 13 4	3070	102 44 18	3070
25	Sun	W.	33 38 16	3454	34 59 32	3452	36 20 50	3450	37 42 10	3447
	Aldebaran	E.	57 28 2	3070	55 59 16	3068	54 30 27	3065	53 1 35	3064
	Saturn	E.	95 20 17	3065	93 51 24	3063	92 22 29	3061	90 53 32	3059
	Pollux	E.	101 24 43	3135	99 57 16	3133	98 29 47	3131	97 2 15	3128
26	Sun	W.	44 29 44	3429	45 51 28	3424	47 13 17	3419	48 35 12	3415
	Venus	W.	24 5 9	3528	25 25 2	3524	26 45 0	3518	28 5 4	3512
	Aldebaran	E.	45 36 28	3047	44 7 13	3043	42 37 53	3039	41 8 28	3034
	Saturn	E.	83 27 55	3043	81 58 36	3039	80 29 11	3034	78 59 41	3030
	Pollux	E.	89 43 38	3110	88 15 41	3106	86 47 39	3102	85 19 32	3098
27	Sun	W.	55 26 24	3382	56 49 1	3374	58 11 47	3365	59 34 43	3357
	Venus	W.	34 47 11	3478	36 8 0	3470	37 28 58	3462	38 50 5	3453
	Aldebaran	E.	33 39 43	3004	32 9 35	2997	30 39 18	2989	29 8 52	2982
	Saturn	E.	71 30 34	3001	70 0 22	2994	68 30 2	2988	66 59 34	2980
	Pollux	E.	77 57 28	3070	76 28 42	3065	74 59 49	3058	73 30 48	3052
28	Sun	W.	66 31 58	3308	67 56 0	3298	69 20 14	3287	70 44 41	3275
	Venus	W.	45 38 19	3402	47 0 33	3392	48 22 59	3379	49 45 39	3368
	Aldebaran	E.	21 34 8	2938	20 2 37	2928	18 30 53	2917	16 58 56	2906
	Saturn	E.	59 24 42	2937	57 53 10	2927	56 21 26	2918	54 49 30	2908
	Pollux	E.	66 3 34	3014	64 33 39	3006	63 3 34	2998	61 33 19	2989
	Regulus	E.	101 42 35	2937	100 11 3	2927	98 39 19	2916	97 7 21	2906

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Tues.	1	22 48 29.26	9.363	S. 7 35 10.2	+56.96	16 10.40	65.43	12 33.44	0.492
Wed.	2	22 52 13.69	9.341	7 12 19.8	57.21	16 10.16	65.36	12 21.35	0.514
Thur.	3	22 55 57.61	9.320	6 49 23.4	57.46	16 9.92	65.29	12 8.76	0.535
Frid.	4	22 59 41.03	9.300	6 26 21.3	+57.69	16 9.68	65.22	11 55.67	0.555
Sat.	5	23 3 23.98	9.281	6 3 13.9	57.91	16 9.43	65.16	11 42.10	0.574
SUN.	6	23 7 6.48	9.262	5 40 1.7	58.10	16 9.18	65.10	11 28.08	0.592
Mon.	7	23 10 48.56	9.245	5 16 45.0	+58.28	16 8.93	65.04	11 13.65	0.609
Tues.	8	23 14 30.23	9.229	4 53 24.2	58.44	16 8.68	64.98	10 58.81	0.625
Wed.	9	23 18 11.52	9.213	4 29 59.6	58.59	16 8.42	64.93	10 43.59	0.641
Thur.	10	23 21 52.45	9.199	4 6 31.6	+58.72	16 8.16	64.88	10 28.00	0.655
Frid.	11	23 25 33.04	9.185	3 43 0.6	58.85	16 7.89	64.83	10 12.09	0.669
Sat.	12	23 29 13.33	9.173	3 19 26.8	58.95	16 7.63	64.78	9 55.88	0.681
SUN.	13	23 32 53.34	9.161	2 55 50.8	+59.04	16 7.36	64.74	9 39.38	0.693
Mon.	14	23 36 33.09	9.151	2 32 12.8	59.11	16 7.09	64.70	9 22.62	0.703
Tues.	15	23 40 12.59	9.142	2 8 33.2	59.18	16 6.82	64.66	9 5.62	0.713
Wed.	16	23 43 51.88	9.133	1 44 52.4	+59.22	16 6.55	64.63	8 48.40	0.721
Thur.	17	23 47 30.97	9.125	1 21 10.6	59.25	16 6.27	64.60	8 30.98	0.729
Frid.	18	23 51 9.88	9.118	0 57 28.3	59.26	16 5.99	64.57	8 13.39	0.736
Sat.	19	23 54 48.63	9.112	0 33 45.9	+59.26	16 5.71	64.55	7 55.64	0.742
SUN.	20	23 58 27.25	9.107	S. 0 10 3.7	59.25	16 5.43	64.53	7 37.76	0.747
Mon.	21	0 2 5.76	9.102	N. 0 13 38.0	59.22	16 5.15	64.51	7 19.76	0.752
Tues.	22	0 5 44.17	9.099	0 37 18.7	+59.17	16 4.87	64.50	7 1.66	0.756
Wed.	23	0 9 22.48	9.095	1 0 58.1	59.11	16 4.60	64.49	6 43.48	0.759
Thur.	24	0 13 0.73	9.093	1 24 35.8	59.03	16 4.32	64.48	6 25.22	0.761
Frid.	25	0 16 38.93	9.091	1 48 11.4	+58.94	16 4.05	64.47	6 6.91	0.763
Sat.	26	0 20 17.09	9.090	2 11 44.6	58.83	16 3.77	64.46	5 48.57	0.764
SUN.	27	0 23 55.22	9.089	2 35 14.9	58.70	16 3.50	64.46	5 30.21	0.765
Mon.	28	0 27 33.35	9.089	2 58 42.1	+58.56	16 3.22	64.46	5 11.84	0.765
Tues.	29	0 31 11.50	9.090	3 22 5.7	58.41	16 2.95	64.47	4 53.49	0.764
Wed.	30	0 34 49.68	9.092	3 45 25.4	58.24	16 2.67	64.48	4 35.17	0.762
Thur.	31	0 38 27.91	9.094	4 8 40.8	58.05	16 2.40	64.49	4 16.90	0.760
Frid.	32	0 42 6.22	9.098	N. 4 31 51.6	+57.85	16 2.13	64.51	3 58.70	0.756

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^s.18$ from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Tues.	1	22 48 27.30	9.364	S. 7 35 22.1	+56.97	12 33.54	0.492	22 35 53.76
Wed.	2	22 52 11.76	9.342	7 12 31.6	57.22	12 21.45	0.514	22 39 50.31
Thur.	3	22 55 55.72	9.321	6 49 35.1	57.47	12 8.86	0.535	22 43 46.86
Frid.	4	22 59 39.18	9.301	6 26 32.8	+57.70	11 55.77	0.555	22 47 43.41
Sat.	5	23 3 22.17	9.282	6 3 25.2	57.92	11 42.21	0.574	22 51 39.96
SUN.	6	23 7 4.71	9.264	5 40 12.8	58.11	11 28.19	0.592	22 55 36.52
Mon.	7	23 10 46.83	9.247	5 16 55.9	+58.29	11 13.76	0.609	22 59 33.07
Tues.	8	23 14 28.54	9.231	4 53 34.9	58.45	10 58.92	0.625	23 3 29.62
Wed.	9	23 18 9.87	9.215	4 30 10.1	58.60	10 43.70	0.641	23 7 26.17
Thur.	10	23 21 50.84	9.201	4 6 41.9	+58.73	10 28.11	0.655	23 11 22.73
Frid.	11	23 25 31.48	9.187	3 43 10.6	58.86	10 12.20	0.669	23 15 19.28
Sat.	12	23 29 11.82	9.175	3 19 36.6	58.96	9 55.99	0.681	23 19 15.83
SUN.	13	23 32 51.87	9.163	2 56 0.3	+59.05	9 39.49	0.693	23 23 12.38
Mon.	14	23 36 31.66	9.153	2 32 22.1	59.12	9 22.73	0.703	23 27 8.93
Tues.	15	23 40 11.21	9.143	2 8 42.2	59.19	9 5.73	0.713	23 31 5.48
Wed.	16	23 43 50.54	9.135	1 45 1.1	+59.23	8 48.50	0.721	23 35 2.04
Thur.	17	23 47 29.67	9.127	1 21 19.0	59.26	8 31.08	0.729	23 38 58.59
Frid.	18	23 51 8.63	9.120	0 57 36.4	59.27	8 13.49	0.736	23 42 55.14
Sat.	19	23 54 47.43	9.114	0 33 53.7	+59.27	7 55.74	0.742	23 46 51.69
SUN.	20	23 58 26.10	9.109	S. 0 10 11.2	59.26	7 37.86	0.747	23 50 48.24
Mon.	21	0 2 4.65	9.104	N. 0 13 30.8	59.23	7 19.86	0.752	23 54 44.79
Tues.	22	0 5 43.10	9.100	0 37 11.8	+59.18	7 1.75	0.756	23 58 41.35
Wed.	23	0 9 21.46	9.097	1 0 51.5	59.12	6 43.56	0.759	0 2 37.90
Thur.	24	0 12 59.75	9.095	1 24 29.5	59.04	6 25.30	0.761	0 6 34.45
Frid.	25	0 16 37.99	9.093	1 48 5.4	+58.95	6 6.99	0.763	0 10 31.00
Sat.	26	0 20 16.20	9.092	2 11 38.9	58.84	5 48.65	0.764	0 14 27.55
SUN.	27	0 23 54.38	9.091	2 35 9.5	58.71	5 30.28	0.765	0 18 24.10
Mon.	28	0 27 32.56	9.091	2 58 37.0	+58.57	5 11.90	0.765	0 22 20.66
Tues.	29	0 31 10.76	9.092	3 22 0.9	58.42	4 53.55	0.764	0 26 17.21
Wed.	30	0 34 48.99	9.094	3 45 20.9	58.25	4 35.23	0.762	0 30 13.76
Thur.	31	0 38 27.27	9.096	4 8 36.6	58.06	4 16.96	0.760	0 34 10.31
Frid.	32	0 42 5.62	9.100	N. 4 31 47.7	+57.86	3 58.75	0.756	0 38 6.87

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing.

Diff. for 1 Hour,
+ 9s.8565.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	60	340 37 28.2	37 28.7	150.43	− 0.82	9.9962250	+ 44.1	1 23 52.46
2	61	341 37 37.4	37 37.8	150.34	0.80	9.9963314	44.5	1 19 56.55
3	62	342 37 44.5	37 44.8	150.25	0.75	9.9964388	45.0	1 16 0.64
4	63	343 37 49.5	37 49.7	150.17	− 0.67	9.9965475	+ 45.5	1 12 4.74
5	64	344 37 52.4	37 52.5	150.08	0.57	9.9966575	46.1	1 8 8.84
6	65	345 37 53.2	37 53.2	149.99	0.46	9.9967688	46.6	1 4 12.93
7	66	346 37 51.9	37 51.9	149.90	− 0.34	9.9968814	+ 47.2	1 0 17.02
8	67	347 37 48.6	37 48.5	149.81	0.20	9.9969954	47.8	0 56 21.12
9	68	348 37 43.2	37 43.0	149.73	− 0.07	9.9971109	48.4	0 52 25.22
10	69	349 37 35.9	37 35.6	149.65	+ 0.05	9.9972278	+ 49.0	0 48 29.31
11	70	350 37 26.7	37 26.3	149.58	0.16	9.9973461	49.5	0 44 33.40
12	71	351 37 15.7	37 15.3	149.50	0.24	9.9974657	50.0	0 40 37.49
13	72	352 37 2.9	37 2.4	149.43	+ 0.30	9.9975864	+ 50.5	0 36 41.59
14	73	353 36 48.4	36 47.8	149.36	0.33	9.9977082	50.9	0 32 45.68
15	74	354 36 32.2	36 31.5	149.29	0.33	9.9978309	51.3	0 28 49.78
16	75	355 36 14.3	36 13.5	149.22	+ 0.29	9.9979545	+ 51.6	0 24 53.87
17	76	356 35 54.6	35 53.8	149.15	0.23	9.9980787	51.9	0 20 57.96
18	77	357 35 33.2	35 32.3	149.07	0.15	9.9982034	52.1	0 17 2.05
19	78	358 35 10.0	35 9.0	149.00	+ 0.04	9.9983284	+ 52.1	0 13 6.14
20	79	359 34 45.1	34 44.0	148.92	− 0.09	9.9984535	52.1	0 9 10.24
21	80	0 34 18.4	34 17.3	148.85	0.22	9.9985785	52.0	0 5 14.34
22	81	1 33 49.9	33 48.7	148.77	− 0.35	9.9987033	+ 52.0	0 1 18.43 23 57 22.52
23	82	2 33 19.5	33 18.2	148.69	0.48	9.9988279	51.9	23 53 26.62
24	83	3 32 47.0	32 45.6	148.61	0.59	9.9989524	51.8	23 49 30.72
25	84	4 32 12.5	32 11.0	148.52	− 0.69	9.9990766	+ 51.6	23 45 34.81
26	85	5 31 35.9	31 34.3	148.43	0.77	9.9992003	51.5	23 41 38.90
27	86	6 30 57.1	30 55.5	148.34	0.82	9.9993235	51.3	23 37 42.99
28	87	7 30 16.1	30 14.4	148.25	− 0.83	9.9994464	+ 51.2	23 33 47.09
29	88	8 29 32.9	29 31.1	148.15	0.81	9.9995691	51.1	23 29 51.18
30	89	9 28 47.4	28 45.5	148.05	0.76	9.9996915	51.0	23 25 55.28
31	90	10 27 59.5	27 57.5	147.95	0.69	9.9998137	50.9	23 21 59.38
32	91	11 27 9.2	27 7.2	147.85	− 0.59	9.9999358	+ 50.9	23 18 3.47

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0ᵈ.0.

Diff. for 1 Hour, — 9ˢ.8296. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 5.8	15 11.1	55 17.6	+1.51	55 36.8	+1.69	5 0.2	1.97	6.6
2	15 16.9	15 23.3	55 58.2	1.87	56 21.6	2.03	5 48.7	2.08	7.6
3	15 30.1	15 37.4	56 46.8	2.16	57 13.5	2.28	6 40.1	2.20	8.6
4	15 45.0	15 52.9	57 41.5	+2.37	58 10.3	+2.42	7 34.2	2.31	9.6
5	16 0.8	16 8.7	58 39.5	2.42	59 8.4	2.37	8 30.7	2.40	10.6
6	16 16.3	16 23.5	59 36.4	2.26	60 2.7	2.09	9 28.7	2.43	11.6
7	16 30.0	16 35.6	60 26.6	+1.86	60 47.4	+1.58	10 27.2	2.43	12.6
8	16 40.3	16 43.7	61 4.4	1.24	61 17.1	+0.85	11 25.2	2.40	13.6
9	16 45.9	16 46.6	61 24.9	+0.43	61 27.5	0.00	12 22.3	2.35	14.6
10	16 45.9	16 43.8	61 25.0	−0.42	61 17.4	−0.83	13 18.3	2.31	15.6
11	16 40.4	16 35.9	61 5.0	1.21	60 48.3	1.55	14 13.5	2.28	16.6
12	16 30.3	16 23.9	60 27.9	1.83	60 4.4	2.05	15 8.2	2.26	17.6
13	16 16.9	16 9.5	59 38.6	−2.21	59 11.3	−2.32	16 2.5	2.26	18.6
14	16 1.8	15 54.0	58 43.0	2.37	58 14.5	2.36	16 56.4	2.24	19.6
15	15 46.3	15 38.9	57 46.3	2.32	57 18.9	2.24	17 49.8	2.21	20.6
16	15 31.7	15 25.0	56 52.7	−2.12	56 28.0	−1.99	18 42.1	2.15	21.6
17	15 18.7	15 13.0	56 4.9	1.85	55 43.7	1.68	19 33.1	2.09	22.6
18	15 7.7	15 3.0	55 24.5	1.52	55 7.3	1.35	20 22.4	2.01	23.6
19	14 58.9	14 55.3	54 52.1	−1.18	54 38.9	−1.02	21 9.8	1.93	24.6
20	14 52.3	14 49.7	54 27.7	0.86	54 18.3	0.71	21 55.3	1.86	25.6
21	14 47.6	14 46.0	54 10.7	0.57	54 4.7	0.43	22 39.3	1.80	26.6
22	14 44.8	14 44.0	54 0.3	−0.30	53 57.4	−0.18	23 22.1	1.77	27.6
23	14 43.6	14 43.6	53 56.0	−0.06	53 55.9	+0.05	6		28.6
24	14 44.0	14 44.6	53 57.2	+0.16	53 59.7	0.26	0 4.3	1.75	29.6
25	14 45.7	14 47.1	54 3.5	+0.37	54 8.6	+0.48	0 46.4	1.76	0.8
26	14 48.8	14 50.9	54 15.0	0.59	54 22.8	0.70	1 28.9	1.79	1.8
27	14 53.4	14 56.3	54 31.9	0.82	54 42.5	0.95	2 12.4	1.85	2.8
28	14 59.6	15 3.3	54 54.6	+1.07	55 8.2	+1.21	2 57.6	1.92	3.8
29	15 7.5	15 12.1	55 23.5	1.34	55 40.4	1.48	3 44.8	2.02	4.8
30	15 17.1	15 22.6	55 58.9	1.61	56 19.0	1.74	4 34.3	2.12	5.8
31	15 28.5	15 34.7	56 40.7	1.86	57 3.7	1.97	5 26.2	2.21	6.8
32	15 41.4	15 48.2	57 28.0	+2.07	57 53.3	+2.13	6 20.1	2.28	7.8

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 1.					**THURSDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 26 39.38	2.0469	N.13 21 43.5	7.376	0	5 9 47.51	2.2561	N.17 57 59.8	3.834
1	3 28 42.31	2.0508	13 29 4.4	7.320	1	5 12 3.01	2.2606	18 1 47.1	3.741
2	3 30 45.48	2.0547	13 36 21.9	7.263	2	5 14 18.78	2.2652	18 5 28.7	3.646
3	3 32 48.88	2.0587	13 43 36.0	7.206	3	5 16 34.83	2.2697	18 9 4.6	3.551
4	3 34 52.52	2.0627	13 50 46.6	7.149	4	5 18 51.15	2.2742	18 12 34.8	3.456
5	3 36 56.40	2.0666	13 57 53.8	7.091	5	5 21 7.73	2.2786	18 15 59.3	3.360
6	3 39 0.51	2.0706	14 4 57.5	7.032	6	5 23 24.58	2.2831	18 19 18.0	3.263
7	3 41 4.87	2.0747	14 11 57.6	6.971	7	5 25 41.70	2.2876	18 22 30.9	3.165
8	3 43 9.47	2.0788	14 18 54.0	6.909	8	5 27 59.09	2.2920	18 25 37.8	3.066
9	3 45 14.32	2.0829	14 25 46.7	6.847	9	5 30 16.74	2.2964	18 28 38.8	2.967
10	3 47 19.42	2.0870	14 32 35.7	6.785	10	5 32 34.66	2.3008	18 31 33.8	2.867
11	3 49 24.76	2.0911	14 39 20.9	6.722	11	5 34 52.84	2.3052	18 34 22.8	2.766
12	3 51 30.35	2.0953	14 46 2.4	6.659	12	5 37 11.29	2.3096	18 37 5.7	2.664
13	3 53 36.20	2.0996	14 52 40.0	6.594	13	5 39 30.00	2.3140	18 39 42.5	2.561
14	3 55 42.30	2.1038	14 59 13.7	6.528	14	5 41 48.97	2.3183	18 42 13.1	2.458
15	3 57 48.65	2.1080	15 5 43.4	6.462	15	5 44 8.19	2.3225	18 44 37.5	2.355
16	3 59 55.26	2.1122	15 12 9.1	6.395	16	5 46 27.67	2.3268	18 46 55.7	2.250
17	4 2 2.12	2.1165	15 18 30.8	6.327	17	5 48 47.41	2.3311	18 49 7.5	2.144
18	4 4 9.24	2.1208	15 24 48.4	6.258	18	5 51 7.40	2.3353	18 51 13.0	2.038
19	4 6 16.62	2.1252	15 31 1.8	6.189	19	5 53 27.65	2.3396	18 53 12.1	1.932
20	4 8 24.26	2.1296	15 37 11.1	6.120	20	5 55 48.15	2.3437	18 55 4.8	1.825
21	4 10 32.17	2.1340	15 43 16.2	6.049	21	5 58 8.89	2.3477	18 56 51.1	1.717
22	4 12 40.34	2.1383	15 49 17.0	5.977	22	6 0 29.88	2.3518	18 58 30.8	1.608
23	4 14 48.77	2.1427	N.15 55 13.5	5.905	23	6 2 51.11	2.3559	N.19 0 4.0	1.498
	WEDNESDAY 2.					**FRIDAY 4.**			
0	4 16 57.47	2.1472	N.16 1 5.6	5.832	0	6 5 12.59	2.3600	N.19 1 30.6	1.388
1	4 19 6.44	2.1517	16 6 53.3	5.757	1	6 7 34.31	2.3640	19 2 50.6	1.277
2	4 21 15.67	2.1561	16 12 36.5	5.682	2	6 9 56.27	2.3679	19 4 3.9	1.166
3	4 23 25.17	2.1606	16 18 15.2	5.607	3	6 12 18.46	2.3718	19 5 10.5	1.054
4	4 25 34.94	2.1651	16 23 49.4	5.531	4	6 14 40.89	2.3756	19 6 10.4	0.941
5	4 27 44.98	2.1695	16 29 18.9	5.453	5	6 17 3.54	2.3794	19 7 3.5	0.828
6	4 29 55.28	2.1739	16 34 43.7	5.374	6	6 19 26.42	2.3832	19 7 49.8	0.715
7	4 32 5.85	2.1785	16 40 3.8	5.296	7	6 21 49.53	2.3870	19 8 29.3	0.601
8	4 34 16.70	2.1832	16 45 19.2	5.217	8	6 24 12.86	2.3907	19 9 1.9	0.485
9	4 36 27.83	2.1878	16 50 29.8	5.137	9	6 26 36.41	2.3943	19 9 27.5	0.369
10	4 38 39.23	2.1923	16 55 35.6	5.055	10	6 29 0.18	2.3980	19 9 46.2	0.253
11	4 40 50.90	2.1968	17 0 36.4	4.972	11	6 31 24.17	2.4016	19 9 57.9	0.136
12	4 43 2.84	2.2013	17 5 32.3	4.890	12	6 33 48.37	2.4051	19 10 2.6	+0.019
13	4 45 15.06	2.2059	17 10 23.2	4.807	13	6 36 12.78	2.4085	19 10 0.2	−0.098
14	4 47 27.55	2.2104	17 15 9.1	4.722	14	6 38 37.39	2.4119	19 9 50.8	0.216
15	4 49 40.31	2.2150	17 19 49.9	4.637	15	6 41 2.21	2.4153	19 9 34.3	0.335
16	4 51 53.35	2.2196	17 24 25.6	4.551	16	6 43 27.23	2.4187	19 9 10.6	0.454
17	4 54 6.66	2.2241	17 28 56.0	4.464	17	6 45 52.45	2.4219	19 8 39.8	0.573
18	4 56 20.24	2.2287	17 33 21.2	4.376	18	6 48 17.86	2.4251	19 8 1.8	0.693
19	4 58 34.10	2.2332	17 37 41.1	4.287	19	6 50 43.46	2.4282	19 7 16.6	0.814
20	5 0 48.23	2.2378	17 41 55.7	4.198	20	6 53 9.25	2.4313	19 6 24.1	0.936
21	5 3 2.64	2.2424	17 46 4.9	4.108	21	6 55 35.22	2.4343	19 5 24.3	1.057
22	5 5 17.32	2.2470	17 50 8.7	4.017	22	6 58 1.37	2.4373	19 4 17.3	1.179
23	5 7 32.28	2.2516	17 54 7.0	3.926	23	7 0 27.70	2.4403	19 3 2.9	1.301
24	5 9 47.51	2.2561	N.17 57 59.8	3.834	24	7 2 54.21	2.4432	N.19 1 41.2	1.423

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 5.					**MONDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 2 54.21	2.4432	N.19 1 41.2	1.423	0	9 2 16.17	2.5056	N.15 30 33.7	7.308
1	7 5 20.88	2.4459	19 0 12.1	1.546	1	9 4 46.50	2.5054	15 23 11.8	7.422
2	7 7 47.72	2.4487	18 58 35.7	1.669	2	9 7 16.81	2.5051	15 15 43.1	7.535
3	7 10 14.73	2.4515	18 56 51.9	1.792	3	9 9 47.11	2.5047	15 8 7.6	7.647
4	7 12 41.90	2.4541	18 55 0.7	1.915	4	9 12 17.38	2.5043	15 0 25.4	7.758
5	7 15 9.22	2.4566	18 53 2.1	2.039	5	9 14 47.63	2.5039	14 52 36.6	7.868
6	7 17 36.69	2.4591	18 50 56.0	2.163	6	9 17 17.85	2.5034	14 44 41.2	7.978
7	7 20 4.31	2.4615	18 48 42.5	2.287	7	9 19 48.04	2.5029	14 36 39.2	8.087
8	7 22 32.07	2.4638	18 46 21.5	2.412	8	9 22 18.20	2.5023	14 28 30.7	8.195
9	7 24 59.98	2.4662	18 43 53.0	2.537	9	9 24 48.32	2.5017	14 20 15.8	8.302
10	7 27 28.02	2.4685	18 41 17.1	2.661	10	9 27 18.40	2.5010	14 11 54.5	8.407
11	7 29 56.20	2.4707	18 38 33.7	2.786	11	9 29 48.44	2.5002	14 3 26.9	8.512
12	7 32 24.51	2.4728	18 35 42.8	2.911	12	9 32 18.43	2.4995	13 54 53.0	8.617
13	7 34 52.94	2.4748	18 32 44.4	3.036	13	9 34 48.38	2.4987	13 46 12.9	8.720
14	7 37 21.49	2.4768	18 29 38.5	3.162	14	9 37 18.28	2.4978	13 37 26.6	8.822
15	7 39 50.16	2.4787	18 26 25.0	3.287	15	9 39 48.12	2.4969	13 28 34.2	8.923
16	7 42 18.94	2.4806	18 23 4.0	3.412	16	9 42 17.91	2.4960	13 19 35.8	9.022
17	7 44 47.83	2.4824	18 19 35.5	3.537	17	9 44 47.64	2.4950	13 10 31.5	9.121
18	7 47 16.83	2.4842	18 15 59.5	3.662	18	9 47 17.31	2.4940	13 1 21.3	9.219
19	7 49 45.93	2.4858	18 12 16.0	3.788	19	9 49 46.92	2.4929	12 52 5.2	9.317
20	7 52 15.12	2.4873	18 8 24.9	3.914	20	9 52 16.46	2.4918	12 42 43.3	9.413
21	7 54 44.40	2.4888	18 4 26.3	4.039	21	9 54 45.94	2.4907	12 33 15.7	9.507
22	7 57 13.78	2.4904	18 0 20.2	4.164	22	9 57 15.35	2.4896	12 23 42.5	9.599
23	7 59 43.25	2.4918	N.17 56 6.6	4.290	23	9 59 44.69	2.4884	N.12 14 3.8	9.691
	SUNDAY 6.					**TUESDAY 8.**			
0	8 2 12.80	2.4931	N.17 51 45.4	4.415	0	10 2 13.96	2.4872	N.12 4 19.6	9.782
1	8 4 42.42	2.4943	17 47 16.8	4.539	1	10 4 43.16	2.4860	11 54 30.0	9.871
2	8 7 12.11	2.4955	17 42 40.7	4.664	2	10 7 12.28	2.4847	11 44 35.1	9.959
3	8 9 41.88	2.4967	17 37 57.1	4.788	3	10 9 41.32	2.4833	11 34 34.9	10.046
4	8 12 11.71	2.4977	17 33 6.1	4.913	4	10 12 10.28	2.4820	11 24 29.6	10.131
5	8 14 41.60	2.4987	17 28 7.6	5.037	5	10 14 39.16	2.4807	11 14 19.2	10.216
6	8 17 11.56	2.4997	17 23 1.7	5.160	6	10 17 7.96	2.4793	11 4 3.7	10.299
7	8 19 41.57	2.5005	17 17 48.4	5.283	7	10 19 36.68	2.4779	10 53 43.3	10.380
8	8 22 11.62	2.5013	17 12 27.7	5.406	8	10 22 5.31	2.4764	10 43 18.1	10.460
9	8 24 41.72	2.5021	17 6 59.7	5.529	9	10 24 33.85	2.4749	10 32 48.1	10.539
10	8 27 11.87	2.5027	17 1 24.3	5.651	10	10 27 2.30	2.4735	10 22 13.4	10.617
11	8 29 42.05	2.5032	16 55 41.6	5.773	11	10 29 30.67	2.4721	10 11 34.1	10.693
12	8 32 12.26	2.5037	16 49 51.6	5.894	12	10 31 58.95	2.4706	10 0 50.2	10.768
13	8 34 42.50	2.5042	16 43 54.3	6.015	13	10 34 27.14	2.4690	9 50 1.9	10.841
14	8 37 12.77	2.5047	16 37 49.8	6.135	14	10 36 55.23	2.4674	9 39 9.3	10.912
15	8 39 43.07	2.5052	16 31 38.1	6.255	15	10 39 23.23	2.4659	9 28 12.4	10.982
16	8 42 13.39	2.5054	16 25 19.2	6.374	16	10 41 51.14	2.4644	9 17 11.4	11.051
17	8 44 43.72	2.5056	16 18 53.2	6.493	17	10 44 18.96	2.4628	9 6 6.3	11.118
18	8 47 14.06	2.5057	16 12 20.0	6.612	18	10 46 46.68	2.4612	8 54 57.2	11.184
19	8 49 44.41	2.5058	16 5 39.7	6.730	19	10 49 14.30	2.4596	8 43 44.2	11.248
20	8 52 14.76	2.5059	15 58 52.4	6.846	20	10 51 41.83	2.4580	8 32 27.4	11.312
21	8 54 45.12	2.5060	15 51 58.2	6.962	21	10 54 9.26	2.4563	8 21 6.8	11.373
22	8 57 15.48	2.5059	15 44 57.0	7.078	22	10 56 36.59	2.4547	8 9 42.6	11.433
23	8 59 45.83	2.5057	15 37 48.8	7.194	23	10 59 3.82	2.4531	7 58 14.9	11.491
24	9 2 16.17	2.5056	N.15 30 33.7	7.308	24	11 1 30.96	2.4515	N. 7 46 43.7	11.547

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 9.					**FRIDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 1 30.96	2.4515	N. 7 46 43.7	11.547	0	12 57 23.13	2.3811	S. 2 1 53.2	12.351
1	11 3 58.00	2.4498	7 35 9.2	11.602	1	12 59 45.96	2.3799	2 14 13.6	12.328
2	11 6 24.94	2.4482	7 23 31.4	11.656	2	13 2 8.72	2.3788	2 26 32.6	12.304
3	11 8 51.78	2.4465	7 11 50.5	11.707	3	13 4 31.42	2.3778	2 38 50.1	12.279
4	11 11 18.52	2.4448	7 0 6.5	11.757	4	13 6 54.06	2.3767	2 51 6.1	12.252
5	11 13 45.16	2.4432	6 48 19.6	11.806	5	13 9 16.63	2.3757	3 3 20.4	12.223
6	11 16 11.70	2.4415	6 36 29.8	11.853	6	13 11 39.14	2.3747	3 15 32.9	12.193
7	11 18 38.14	2.4399	6 24 37.2	11.899	7	13 14 1.59	2.3737	3 27 43.6	12.162
8	11 21 4.49	2.4383	6 12 41.9	11.942	8	13 16 23.98	2.3727	3 39 52.3	12.128
9	11 23 30.74	2.4367	6 0 44.1	11.984	9	13 18 46.32	2.3718	3 51 59.0	12.094
10	11 25 56.89	2.4350	5 48 43.8	12.025	10	13 21 8.60	2.3709	4 4 3.6	12.058
11	11 28 22.94	2.4333	5 36 41.1	12.064	11	13 23 30.83	2.3700	4 16 6.0	12.021
12	11 30 48.89	2.4317	5 24 36.1	12.102	12	13 25 53.00	2.3691	4 28 6.1	11.982
13	11 33 14.74	2.4301	5 12 28.9	12.138	13	13 28 15.12	2.3682	4 40 3.9	11.942
14	11 35 40.50	2.4285	5 0 19.6	12.172	14	13 30 37.19	2.3673	4 51 59.2	11.901
15	11 38 6.16	2.4268	4 48 8.3	12.203	15	13 32 59.20	2.3664	5 3 52.0	11.858
16	11 40 31.72	2.4252	4 35 55.2	12.233	16	13 35 21.16	2.3657	5 15 42.2	11.814
17	11 42 57.19	2.4237	4 23 40.3	12.262	17	13 37 43.08	2.3649	5 27 29.7	11.768
18	11 45 22.56	2.4221	4 11 23.7	12.290	18	13 40 4.95	2.3641	5 39 14.4	11.722
19	11 47 47.84	2.4205	3 59 5.5	12.316	19	13 42 26.77	2.3633	5 50 56.3	11.674
20	11 50 13.02	2.4189	3 46 45.8	12.341	20	13 44 48.55	2.3626	6 2 35.3	11.624
21	11 52 38.11	2.4174	3 34 24.6	12.364	21	13 47 10.28	2.3618	6 14 11.2	11.573
22	11 55 3.11	2.4158	3 22 2.1	12.384	22	13 49 31.97	2.3611	6 25 44.0	11.521
23	11 57 28.01	2.4142	N. 3 9 38.5	12.402	23	13 51 53.61	2.3603	S. 6 37 13.7	11.468
	THURSDAY 10.					**SATURDAY 12.**			
0	11 59 52.82	2.4127	N. 2 57 13.8	12.420	0	13 54 15.21	2.3597	S. 6 48 40.2	11.414
1	12 2 17.54	2.4112	2 44 48.1	12.436	1	13 56 36.77	2.3590	7 0 3.4	11.358
2	12 4 42.17	2.4097	2 32 21.5	12.450	2	13 58 58.29	2.3583	7 11 23.2	11.301
3	12 7 6.71	2.4082	2 19 54.1	12.462	3	14 1 19.77	2.3577	7 22 39.5	11.242
4	12 9 31.16	2.4067	2 7 26.0	12.473	4	14 3 41.21	2.3570	7 33 52.3	11.183
5	12 11 55.52	2.4053	1 54 57.3	12.483	5	14 6 2.61	2.3564	7 45 1.5	11.122
6	12 14 19.80	2.4039	1 42 28.0	12.491	6	14 8 23.98	2.3558	7 56 7.0	11.061
7	12 16 43.99	2.4025	1 29 58.3	12.497	7	14 10 45.31	2.3552	8 7 8.8	10.996
8	12 19 8.10	2.4011	1 17 28.4	12.500	8	14 13 6.60	2.3546	8 18 6.8	10.934
9	12 21 32.12	2.3997	1 4 58.3	12.502	9	14 15 27.86	2.3540	8 29 0.9	10.869
10	12 23 56.06	2.3983	0 52 28.1	12.504	10	14 17 49.08	2.3534	8 39 51.1	10.803
11	12 26 19.92	2.3970	0 39 57.8	12.504	11	14 20 10.27	2.3528	8 50 37.3	10.736
12	12 28 43.70	2.3957	0 27 27.6	12.502	12	14 22 31.42	2.3522	9 1 19.4	10.667
13	12 31 7.40	2.3943	0 14 57.6	12.498	13	14 24 52.54	2.3517	9 11 57.3	10.597
14	12 33 31.02	2.3930	N. 0 2 27.9	12.492	14	14 27 13.63	2.3512	9 22 31.1	10.527
15	12 35 54.56	2.3917	S. 0 10 1.4	12.485	15	14 29 34.69	2.3507	9 33 0.6	10.456
16	12 38 18.03	2.3905	0 22 30.3	12.477	16	14 31 55.72	2.3502	9 43 25.8	10.383
17	12 40 41.42	2.3892	0 34 58.6	12.467	17	14 34 16.71	2.3497	9 53 46.6	10.309
18	12 43 4.73	2.3879	0 47 26.3	12.455	18	14 36 37.68	2.3492	10 4 2.9	10.234
19	12 45 27.97	2.3867	0 59 53.2	12.442	19	14 38 58.62	2.3487	10 14 14.7	10.159
20	12 47 51.14	2.3856	1 12 19.3	12.427	20	14 41 19.52	2.3481	10 24 22.0	10.083
21	12 50 14.24	2.3843	1 24 44.4	12.410	21	14 43 40.39	2.3476	10 34 24.7	10.006
22	12 52 37.27	2.3832	1 37 8.5	12.392	22	14 46 1.23	2.3472	10 44 22.7	9.927
23	12 55 0.23	2.3822	1 49 31.5	12.372	23	14 48 22.05	2.3467	10 54 16.0	9.847
24	12 57 23.13	2.3811	S. 2 1 53.2	12.351	24	14 50 42.84	2.3462	S. 11 4 4.4	9.767

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 50 42.84	2.3462	S. 11 4 4.4	9.767
1	14 53 3.60	2.3457	11 13 48.0	9.687
2	14 55 24.33	2.3452	11 23 26.8	9.605
3	14 57 45.03	2.3447	11 33 0.6	9.522
4	15 0 5.70	2.3443	11 42 29.4	9.438
5	15 2 26.35	2.3438	11 51 53.2	9.354
6	15 4 46.96	2.3433	12 1 11.9	9.268
7	15 7 7.54	2.3428	12 10 25.4	9.182
8	15 9 28.10	2.3424	12 19 33.8	9.096
9	15 11 48.63	2.3419	12 28 37.0	9.009
10	15 14 9.13	2.3414	12 37 34.9	8.920
11	15 16 29.60	2.3409	12 46 27.4	8.831
12	15 18 50.04	2.3404	12 55 14.6	8.742
13	15 21 10.45	2.3399	13 3 56.4	8.651
14	15 23 30.83	2.3394	13 12 32.7	8.560
15	15 25 51.18	2.3389	13 21 3.6	8.469
16	15 28 11.50	2.3384	13 29 29.0	8.376
17	15 30 31.79	2.3378	13 37 48.8	8.282
18	15 32 52.04	2.3372	13 46 2.9	8.188
19	15 35 12.26	2.3367	13 54 11.4	8.094
20	15 37 32.45	2.3362	14 2 14.2	7.999
21	15 39 52.61	2.3357	14 10 11.3	7.904
22	15 42 12.73	2.3351	14 18 2.7	7.809
23	15 44 32.82	2.3345	S. 14 25 48.4	7.713

MONDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 46 52.87	2.3339	S. 14 33 28.3	7.616
1	15 49 12.89	2.3333	14 41 2.3	7.518
2	15 51 32.87	2.3327	14 48 30.4	7.419
3	15 53 52.81	2.3320	14 55 52.6	7.321
4	15 56 12.71	2.3313	15 3 8.9	7.222
5	15 58 32.57	2.3307	15 10 19.2	7.122
6	16 0 52.40	2.3301	15 17 23.5	7.022
7	16 3 12.18	2.3294	15 24 21.8	6.922
8	16 5 31.92	2.3287	15 31 14.1	6.821
9	16 7 51.62	2.3280	15 38 0.3	6.719
10	16 10 11.28	2.3272	15 44 40.4	6.617
11	16 12 30.89	2.3264	15 51 14.4	6.515
12	16 14 50.45	2.3256	15 57 42.2	6.412
13	16 17 9.96	2.3248	16 4 3.8	6.309
14	16 19 29.43	2.3241	16 10 19.3	6.207
15	16 21 48.85	2.3233	16 16 28.7	6.105
16	16 24 8.22	2.3224	16 22 31.9	6.001
17	16 26 27.54	2.3215	16 28 28.8	5.897
18	16 28 46.80	2.3206	16 34 19.5	5.792
19	16 31 6.01	2.3197	16 40 3.9	5.687
20	16 33 25.16	2.3187	16 45 42.0	5.583
21	16 35 44.26	2.3178	16 51 13.9	5.478
22	16 38 3.30	2.3168	16 56 39.4	5.373
23	16 40 22.28	2.3157	17 1 58.6	5.268
24	16 42 41.19	2.3147	S. 17 7 11.5	5.163

TUESDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 42 41.19	2.3147	S. 17 7 11.5	5.163
1	16 45 0.04	2.3137	17 12 18.1	5.057
2	16 47 18.83	2.3126	17 17 18.3	4.950
3	16 49 37.55	2.3115	17 22 12.1	4.843
4	16 51 56.21	2.3104	17 26 59.5	4.737
5	16 54 14.80	2.3093	17 31 40.6	4.631
6	16 56 33.32	2.3081	17 36 15.3	4.525
7	16 58 51.77	2.3068	17 40 43.6	4.418
8	17 1 10.14	2.3056	17 45 5.5	4.312
9	17 3 28.44	2.3043	17 49 21.0	4.205
10	17 5 46.66	2.3031	17 53 30.1	4.098
11	17 8 4.81	2.3018	17 57 32.8	3.991
12	17 10 22.88	2.3005	18 1 29.0	3.884
13	17 12 40.87	2.2991	18 5 18.8	3.777
14	17 14 58.77	2.2977	18 9 2.2	3.670
15	17 17 16.59	2.2962	18 12 39.2	3.563
16	17 19 34.32	2.2947	18 16 9.8	3.456
17	17 21 51.96	2.2933	18 19 33.9	3.349
18	17 24 9.52	2.2919	18 22 51.6	3.242
19	17 26 26.99	2.2903	18 26 2.9	3.135
20	17 28 44.36	2.2888	18 29 7.8	3.027
21	17 31 1.64	2.2872	18 32 6.2	2.920
22	17 33 18.82	2.2855	18 34 58.2	2.813
23	17 35 35.90	2.2839	S. 18 37 43.8	2.707

WEDNESDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 37 52.89	2.2822	S. 18 40 23.1	2.601
1	17 40 9.77	2.2805	18 42 56.0	2.494
2	17 42 26.55	2.2788	18 45 22.4	2.387
3	17 44 43.23	2.2771	18 47 42.4	2.280
4	17 46 59.80	2.2753	18 49 56.0	2.174
5	17 49 16.26	2.2735	18 52 3.3	2.068
6	17 51 32.62	2.2717	18 54 4.2	1.962
7	17 53 48.86	2.2698	18 55 58.8	1.857
8	17 56 4.99	2.2678	18 57 47.0	1.751
9	17 58 21.00	2.2659	18 59 28.9	1.646
10	18 0 36.90	2.2640	19 1 4.5	1.541
11	18 2 52.68	2.2620	19 2 33.8	1.435
12	18 5 8.34	2.2600	19 3 56.7	1.329
13	18 7 23.88	2.2580	19 5 13.3	1.225
14	18 9 39.30	2.2559	19 6 23.7	1.121
15	18 11 54.59	2.2538	19 7 27.9	1.017
16	18 14 9.75	2.2517	19 8 25.8	0.913
17	18 16 24.79	2.2496	19 9 17.5	0.810
18	18 18 39.70	2.2474	19 10 3.0	0.707
19	18 20 54.48	2.2452	19 10 42.3	0.603
20	18 23 9.12	2.2429	19 11 15.4	0.500
21	18 25 23.63	2.2407	19 11 42.3	0.397
22	18 27 38.00	2.2384	19 12 3.0	0.294
23	18 29 52.24	2.2361	19 12 17.6	0.192
24	18 32 6.34	2.2338	S. 19 12 26.1	−0.091

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 32 6.34	2.2338	S. 19 12 26.1	−0.091
1	18 34 20.30	2.2315	19 12 28.5	+0.011
2	18 36 34.12	2.2291	19 12 24.8	0.112
3	18 38 47.79	2.2267	19 12 15.1	0.212
4	18 41 1.32	2.2242	19 11 59.4	0.312
5	18 43 14.70	2.2218	19 11 37.6	0.413
6	18 45 27.94	2.2194	19 11 9.8	0.513
7	18 47 41.03	2.2169	19 10 36.0	0.612
8	18 49 53.97	2.2143	19 9 56.3	0.711
9	18 52 6.75	2.2118	19 9 10.7	0.809
10	18 54 19.38	2.2093	19 8 19.2	0.908
11	18 56 31.86	2.2067	19 7 21.8	1.006
12	18 58 44.18	2.2040	19 6 18.5	1.103
13	19 0 56.34	2.2014	19 5 9.4	1.200
14	19 3 8.35	2.1988	19 3 54.5	1.297
15	19 5 20.20	2.1962	19 2 33.7	1.394
16	19 7 31.89	2.1935	19 1 7.2	1.489
17	19 9 43.42	2.1908	18 59 35.0	1.585
18	19 11 54.79	2.1881	18 57 57.0	1.681
19	19 14 5.99	2.1854	18 56 13.3	1.775
20	19 16 17.03	2.1827	18 54 24.0	1.869
21	19 18 27.91	2.1799	18 52 29.0	1.963
22	19 20 38.62	2.1771	18 50 28.4	2.056
23	19 22 49.17	2.1743	S. 18 48 22.2	2.149

FRIDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 24 59.54	2.1714	S. 18 46 10.5	2.242
1	19 27 9.74	2.1686	18 43 53.2	2.334
2	19 29 19.78	2.1659	18 41 30.4	2.425
3	19 31 29.65	2.1631	18 39 2.2	2.516
4	19 33 39.35	2.1602	18 36 28.5	2.607
5	19 35 48.87	2.1573	18 33 49.4	2.697
6	19 37 58.22	2.1544	18 31 4.9	2.787
7	19 40 7.40	2.1515	18 28 15.0	2.876
8	19 42 16.40	2.1486	18 25 19.8	2.964
9	19 44 25.23	2.1457	18 22 19.3	3.052
10	19 46 33.88	2.1427	18 19 13.5	3.140
11	19 48 42.36	2.1398	18 16 2.5	3.228
12	19 50 50.66	2.1369	18 12 46.2	3.315
13	19 52 58.79	2.1340	18 9 24.7	3.401
14	19 55 6.74	2.1310	18 5 58.1	3.486
15	19 57 14.51	2.1280	18 2 26.4	3.571
16	19 59 22.10	2.1251	17 58 49.6	3.655
17	20 1 29.52	2.1221	17 55 7.8	3.739
18	20 3 36.75	2.1190	17 51 20.9	3.823
19	20 5 43.80	2.1161	17 47 29.0	3.906
20	20 7 50.68	2.1132	17 43 32.2	3.989
21	20 9 57.38	2.1102	17 39 30.4	4.071
22	20 12 3.90	2.1072	17 35 23.7	4.152
23	20 14 10.24	2.1042	17 31 12.2	4.232
24	20 16 16.40	2.1012	S. 17 26 55.9	4.312

SATURDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 16 16.40	2.1012	S. 17 26 55.9	4.312
1	20 18 22.38	2.0982	17 22 34.8	4.392
2	20 20 28.18	2.0952	17 18 8.9	4.472
3	20 22 33.80	2.0922	17 13 38.2	4.551
4	20 24 39.25	2.0892	17 9 2.8	4.629
5	20 26 44.51	2.0862	17 4 22.8	4.706
6	20 28 49.59	2.0832	16 59 38.1	4.783
7	20 30 54.49	2.0802	16 54 48.8	4.859
8	20 32 59.21	2.0772	16 49 55.0	4.935
9	20 35 3.75	2.0742	16 44 56.6	5.011
10	20 37 8.12	2.0713	16 39 53.7	5.086
11	20 39 12.31	2.0683	16 34 46.3	5.160
12	20 41 16.32	2.0653	16 29 34.5	5.233
13	20 43 20.15	2.0623	16 24 18.3	5.306
14	20 45 23.80	2.0594	16 18 57.7	5.379
15	20 47 27.28	2.0565	16 13 32.8	5.451
16	20 49 30.58	2.0535	16 8 3.6	5.522
17	20 51 33.70	2.0506	16 2 30.1	5.593
18	20 53 36.65	2.0477	15 56 52.4	5.663
19	20 55 39.42	2.0447	15 51 10.5	5.733
20	20 57 42.02	2.0418	15 45 24.4	5.803
21	20 59 44.44	2.0389	15 39 34.2	5.871
22	21 1 46.69	2.0361	15 33 39.9	5.938
23	21 3 48.77	2.0332	S. 15 27 41.6	6.006

SUNDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	21 5 50.67	2.0302	S. 15 21 39.2	6.073
1	21 7 52.40	2.0274	15 15 32.8	6.139
2	21 9 53.96	2.0246	15 9 22.5	6.204
3	21 11 55.35	2.0218	15 3 8.3	6.269
4	21 13 56.57	2.0189	14 56 50.2	6.333
5	21 15 57.62	2.0161	14 50 28.3	6.397
6	21 17 58.51	2.0134	14 44 2.6	6.460
7	21 19 59.23	2.0106	14 37 33.1	6.522
8	21 21 59.78	2.0078	14 30 59.9	6.585
9	21 24 0.17	2.0051	14 24 22.9	6.647
10	21 26 0.39	2.0024	14 17 42.3	6.708
11	21 28 0.45	1.9997	14 10 58.0	6.768
12	21 30 0.35	1.9970	14 4 10.1	6.827
13	21 32 0.09	1.9943	13 57 18.7	6.886
14	21 33 59.67	1.9916	13 50 23.8	6.944
15	21 35 59.06	1.9889	13 43 25.4	7.003
16	21 37 58.34	1.9863	13 36 23.5	7.061
17	21 39 57.44	1.9837	13 29 18.1	7.118
18	21 41 56.39	1.9812	13 22 9.3	7.174
19	21 43 55.18	1.9786	13 14 57.2	7.229
20	21 45 53.82	1.9761	13 7 41.8	7.283
21	21 47 52.31	1.9736	13 0 23.2	7.337
22	21 49 50.65	1.9711	12 53 1.3	7.391
23	21 51 48.84	1.9686	12 45 36.2	7.444
24	21 53 46.88	1.9662	S. 12 38 8.0	7.497

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 21.					WEDNESDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 53 46.88	1.9662	S. 12 38 8.0	7.497	0	23 25 49.10	1.8800	S. 5 49 5.9	9.317
1	21 55 44.78	1.9637	12 30 36.6	7.549	1	23 27 41.87	1.8790	5 39 46.2	9.340
2	21 57 42.53	1.9612	12 23 2.1	7.600	2	23 29 34.58	1.8780	5 30 25.1	9.362
3	21 59 40.13	1.9588	12 15 24.6	7.651	3	23 31 27.23	1.8771	5 21 2.7	9.384
4	22 1 37.59	1.9565	12 7 44.0	7.702	4	23 33 19.83	1.8762	5 11 39.0	9.406
5	22 3 34.91	1.9542	12 0 0.4	7.751	5	23 35 12.37	1.8753	5 2 14.0	9.427
6	22 5 32.09	1.9519	11 52 13.9	7.799	6	23 37 4.86	1.8744	4 52 47.7	9.448
7	22 7 29.13	1.9496	11 44 24.5	7.848	7	23 38 57.30	1.8736	4 43 20.2	9.467
8	22 9 26.04	1.9473	11 36 32.2	7.896	8	23 40 49.69	1.8728	4 33 51.6	9.486
9	22 11 22.81	1.9451	11 28 37.0	7.943	9	23 42 42.04	1.8721	4 24 21.9	9.504
10	22 13 19.45	1.9428	11 20 39.0	7.990	10	23 44 34.34	1.8714	4 14 51.1	9.522
11	22 15 15.95	1.9406	11 12 38.2	8.036	11	23 46 26.60	1.8707	4 5 19.2	9.540
12	22 17 12.32	1.9384	11 4 34.7	8.081	12	23 48 18.82	1.8700	3 55 46.3	9.557
13	22 19 8.56	1.9363	10 56 28.5	8.126	13	23 50 11.00	1.8694	3 46 12.4	9.573
14	22 21 4.68	1.9342	10 48 19.6	8.170	14	23 52 3.15	1.8689	3 36 37.6	9.588
15	22 23 0.67	1.9322	10 40 8.1	8.213	15	23 53 55.27	1.8683	3 27 1.8	9.603
16	22 24 56.54	1.9301	10 31 54.0	8.256	16	23 55 47.35	1.8678	3 17 25.2	9.617
17	22 26 52.28	1.9280	10 23 37.4	8.299	17	23 57 39.41	1.8674	3 7 47.7	9.631
18	22 28 47.90	1.9260	10 15 18.2	8.341	18	23 59 31.44	1.8670	2 58 9.4	9.644
19	22 30 43.40	1.9241	10 6 56.5	8.382	19	0 1 23.45	1.8666	2 48 30.4	9.657
20	22 32 38.79	1.9222	9 58 32.4	8.423	20	0 3 15.43	1.8662	2 38 50.6	9.669
21	22 34 34.06	1.9202	9 50 5.8	8.463	21	0 5 7.39	1.8659	2 29 10.1	9.680
22	22 36 29.22	1.9183	9 41 36.8	8.502	22	0 6 59.34	1.8656	2 19 29.0	9.691
23	22 38 24.26	1.9164	S. 9 33 5.5	8.540	23	0 8 51.27	1.8653	S. 2 9 47.2	9.702
	TUESDAY 22.					THURSDAY 24.			
0	22 40 19.19	1.9146	S. 9 24 32.0	8.578	0	0 10 43.18	1.8651	S. 2 0 4.8	9.711
1	22 42 14.01	1.9128	9 15 56.2	8.616	1	0 12 35.08	1.8650	1 50 21.9	9.719
2	22 44 8.73	1.9111	9 7 18.1	8.653	2	0 14 26.98	1.8649	1 40 38.5	9.728
3	22 46 3.34	1.9093	8 58 37.8	8.690	3	0 16 18.87	1.8648	1 30 54.6	9.736
4	22 47 57.85	1.9076	8 49 55.3	8.726	4	0 18 10.76	1.8648	1 21 10.2	9.743
5	22 49 52.25	1.9058	8 41 10.7	8.761	5	0 20 2.65	1.8647	1 11 25.4	9.749
6	22 51 46.55	1.9042	8 32 24.0	8.796	6	0 21 54.53	1.8647	1 1 40.3	9.755
7	22 53 40.76	1.9026	8 23 35.2	8.830	7	0 23 46.42	1.8648	0 51 54.8	9.761
8	22 55 34.87	1.9010	8 14 44.4	8.863	8	0 25 38.31	1.8649	0 42 9.0	9.765
9	22 57 28.88	1.8994	8 5 51.6	8.896	9	0 27 30.21	1.8651	0 32 23.0	9.769
10	22 59 22.80	1.8979	7 56 56.9	8.928	10	0 29 22.12	1.8652	0 22 36.7	9.772
11	23 1 16.63	1.8964	7 48 0.3	8.959	11	0 31 14.04	1.8654	0 12 50.3	9.775
12	23 3 10.37	1.8950	7 39 1.8	8.991	12	0 33 5.97	1.8657	S. 0 3 3.7	9.777
13	23 5 4.03	1.8936	7 30 1.4	9.022	13	0 34 57.92	1.8660	N. 0 6 43.0	9.779
14	23 6 57.60	1.8922	7 20 59.2	9.051	14	0 36 49.89	1.8663	0 16 29.8	9.780
15	23 8 51.09	1.8908	7 11 55.3	9.080	15	0 38 41.88	1.8667	0 26 16.6	9.780
16	23 10 44.50	1.8895	7 2 49.6	9.109	16	0 40 33.89	1.8670	0 36 3.4	9.780
17	23 12 37.83	1.8882	6 53 42.2	9.137	17	0 42 25.92	1.8674	0 45 50.2	9.780
18	23 14 31.08	1.8869	6 44 33.2	9.164	18	0 44 17.98	1.8679	0 55 37.0	9.779
19	23 16 24.26	1.8857	6 35 22.5	9.191	19	0 46 10.07	1.8685	1 5 23.7	9.777
20	23 18 17.37	1.8845	6 26 10.2	9.217	20	0 48 2.20	1.8691	1 15 10.2	9.774
21	23 20 10.40	1.8833	6 16 56.4	9.243	21	0 49 54.36	1.8697	1 24 56.5	9.770
22	23 22 3.37	1.8822	6 7 41.0	9.268	22	0 51 46.56	1.8703	1 34 42.6	9.766
23	23 23 56.27	1.8811	5 58 24.2	9.293	23	0 53 38.80	1.8709	1 44 28.5	9.762
24	23 25 49.10	1.8800	S. 5 49 5.9	9.317	24	0 55 31.07	1.8716	N. 1 54 14.1	9.757

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 55 31.07	1.8716	N. 1 54 14.1	9.757
1	0 57 23.39	1.8724	2 3 59.4	9.752
2	0 59 15.76	1.8731	2 13 44.3	9.745
3	1 1 8.17	1.8739	2 23 28.8	9.738
4	1 3 0.63	1.8748	2 33 12.9	9.731
5	1 4 53.15	1.8757	2 42 56.5	9.723
6	1 6 45.72	1.8767	2 52 39.6	9.714
7	1 8 38.35	1.8777	3 2 22.2	9.705
8	1 10 31.04	1.8787	3 12 4.2	9.694
9	1 12 23.79	1.8797	3 21 45.5	9.683
10	1 14 16.60	1.8808	3 31 26.2	9.672
11	1 16 9.48	1.8819	3 41 6.2	9.660
12	1 18 2.43	1.8831	3 50 45.4	9.647
13	1 19 55.45	1.8843	4 0 23.8	9.634
14	1 21 48.54	1.8855	4 10 1.5	9.621
15	1 23 41.71	1.8867	4 19 38.4	9.607
16	1 25 34.95	1.8880	4 29 14.4	9.592
17	1 27 28.27	1.8894	4 38 49.4	9.576
18	1 29 21.68	1.8908	4 48 23.5	9.560
19	1 31 15.17	1.8922	4 57 56.6	9.543
20	1 33 8.75	1.8937	5 7 28.6	9.525
21	1 35 2.41	1.8951	5 16 59.6	9.507
22	1 36 56.16	1.8966	5 26 29.4	9.488
23	1 38 50.01	1.8982	N. 5 35 58.1	9.468

SATURDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 40 43.95	1.8998	N. 5 45 25.6	9.448
1	1 42 37.99	1.9015	5 54 51.9	9.427
2	1 44 32.13	1.9032	6 4 16.9	9.406
3	1 46 26.38	1.9050	6 13 40.6	9.384
4	1 48 20.73	1.9067	6 23 3.0	9.362
5	1 50 15.18	1.9084	6 32 24.0	9.338
6	1 52 9.74	1.9102	6 41 43.6	9.314
7	1 54 4.41	1.9121	6 51 1.7	9.289
8	1 55 59.20	1.9141	7 0 18.3	9.264
9	1 57 54.10	1.9160	7 9 33.4	9.238
10	1 59 49.12	1.9180	7 18 46.9	9.212
11	2 1 44.26	1.9199	7 27 58.8	9.185
12	2 3 39.51	1.9219	7 37 9.1	9.157
13	2 5 34.89	1.9241	7 46 17.7	9.128
14	2 7 30.40	1.9262	7 55 24.5	9.099
15	2 9 26.03	1.9283	8 4 29.6	9.069
16	2 11 21.79	1.9305	8 13 32.8	9.038
17	2 13 17.69	1.9327	8 22 34.2	9.007
18	2 15 13.72	1.9350	8 31 33.7	8.976
19	2 17 9.89	1.9373	8 40 31.3	8.944
20	2 19 6.20	1.9396	8 49 27.0	8.911
21	2 21 2.64	1.9419	8 58 20.6	8.876
22	2 22 59.23	1.9443	9 7 12.1	8.841
23	2 24 55.96	1.9467	9 16 1.5	8.806
24	2 26 52.83	1.9491	N. 9 24 48.8	8.771

SUNDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 26 52.83	1.9491	N. 9 24 48.8	8.771
1	2 28 49.85	1.9516	9 33 34.0	8.734
2	2 30 47.03	1.9542	9 42 16.9	8.697
3	2 32 44.36	1.9567	9 50 57.6	8.659
4	2 34 41.84	1.9593	9 59 36.0	8.620
5	2 36 39.48	1.9619	10 8 12.0	8.581
6	2 38 37.27	1.9645	10 16 45.7	8.549
7	2 40 35.22	1.9672	10 25 17.0	8.501
8	2 42 33.34	1.9700	10 33 45.8	8.460
9	2 44 31.62	1.9727	10 42 12.2	8.418
10	2 46 30.07	1.9755	10 50 36.0	8.375
11	2 48 28.68	1.9783	10 58 57.2	8.332
12	2 50 27.46	1.9811	11 7 15.8	8.288
13	2 52 26.41	1.9839	11 15 31.8	8.243
14	2 54 25.53	1.9868	11 23 45.0	8.198
15	2 56 24.83	1.9898	11 31 55.5	8.152
16	2 58 24.31	1.9927	11 40 3.2	8.105
17	3 0 23.96	1.9957	11 48 8.1	8.057
18	3 2 23.79	1.9987	11 56 10.1	8.009
19	3 4 23.80	2.0017	12 4 9.2	7.961
20	3 6 24.00	2.0048	12 12 5.4	7.912
21	3 8 24.38	2.0079	12 19 58.6	7.861
22	3 10 24.95	2.0110	12 27 48.7	7.810
23	3 12 25.70	2.0141	N.12 35 35.8	7.759

MONDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	3 14 26.64	2.0172	N.12 43 19.8	7.707
1	3 16 27.77	2.0204	12 51 0.6	7.654
2	3 18 29.09	2.0237	12 58 38.2	7.600
3	3 20 30.61	2.0269	13 6 12.6	7.546
4	3 22 32.32	2.0302	13 13 43.7	7.491
5	3 24 34.23	2.0335	13 21 11.5	7.435
6	3 26 36.34	2.0367	13 28 35.9	7.378
7	3 28 38.64	2.0400	13 35 56.9	7.321
8	3 30 41.14	2.0434	13 43 14.4	7.262
9	3 32 43.85	2.0468	13 50 28.4	7.203
10	3 34 46.76	2.0502	13 57 38.8	7.144
11	3 36 49.87	2.0536	14 4 45.7	7.085
12	3 38 53.19	2.0571	14 11 49.0	7.024
13	3 40 56.72	2.0605	14 18 48.6	6.962
14	3 43 0.45	2.0639	14 25 44.5	6.900
15	3 45 4.39	2.0674	14 32 36.6	6.836
16	3 47 8.54	2.0709	14 39 24.9	6.772
17	3 49 12.90	2.0744	14 46 9.3	6.708
18	3 51 17.47	2.0780	14 52 49.9	6.644
19	3 53 22.26	2.0816	14 59 26.6	6.578
20	3 55 27.26	2.0851	15 5 59.3	6.511
21	3 57 32.47	2.0887	15 12 27.9	6.443
22	3 59 37.90	2.0923	15 18 52.5	6.376
23	4 1 43.55	2.0959	15 25 13.0	6.308
24	4 3 49.41	2.0995	N.15 31 29.4	6.239

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 3 49.41	2.0995	N.15 31 29.4	6.239
1	4 5 55.49	2.1032	15 37 41.7	6.169
2	4 8 1.79	2.1069	15 43 49.7	6.098
3	4 10 8.31	2.1106	15 49 53.4	6.026
4	4 12 15.06	2.1142	15 55 52.8	5.954
5	4 14 22.02	2.1179	16 1 47.9	5.881
6	4 16 29.20	2.1216	16 7 38.6	5.807
7	4 18 36.61	2.1253	16 13 24.8	5.733
8	4 20 44.24	2.1290	16 19 6.6	5.659
9	4 22 52.09	2.1327	16 24 43.9	5.583
10	4 25 0.16	2.1364	16 30 16.6	5.506
11	4 27 8.46	2.1402	16 35 44.6	5.429
12	4 29 16.98	2.1439	16 41 8.0	5.351
13	4 31 25.73	2.1476	16 46 26.7	5.272
14	4 33 34.70	2.1513	16 51 40.6	5.192
15	4 35 43.89	2.1551	16 56 49.8	5.112
16	4 37 53.31	2.1588	17 1 54.1	5.032
17	4 40 2.95	2.1625	17 6 53.6	4.951
18	4 42 12.81	2.1663	17 11 48.2	4.868
19	4 44 22.90	2.1701	17 16 37.8	4.785
20	4 46 33.22	2.1738	17 21 22.4	4.702
21	4 48 43.76	2.1775	17 26 2.:	4.619
22	4 50 54.52	2.1812	17 30 36.7	4.534
23	4 53 5.51	2.1850	N.17 35 6.1	4.448

WEDNESDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	4 55 16.72	2.1887	N.17 39 30.4	4.362
1	4 57 28.15	2.1924	17 43 49.5	4.275
2	4 59 39.81	2.1961	17 48 3.4	4.187
3	5 1 51.69	2.1998	17 52 12.0	4.099
4	5 4 3.79	2.2035	17 56 15.3	4.010
5	5 6 16.11	2.2072	18 0 13.2	3.920
6	5 8 28.65	2.2109	18 4 5.7	3.830
7	5 10 41.42	2.2146	18 7 52.8	3.739
8	5 12 54.41	2.2183	18 11 34.4	3.647
9	5 15 7.62	2.2220	18 15 10.5	3.555
10	5 17 21.05	2.2256	18 18 41.0	3.462
11	5 19 34.69	2.2292	18 22 5.9	3.368
12	5 21 48.55	2.2328	18 25 25.2	3.274
13	5 24 2.63	2.2364	18 28 38.8	3.179
14	5 26 16.92	2.2400	18 31 46.7	3.084
15	5 28 31.43	2.2436	18 34 48.9	2.988
16	5 30 46.15	2.2471	18 37 45.3	2.891
17	5 33 1.08	2.2507	18 40 35.8	2.794
18	5 35 16.23	2.2542	18 43 20.5	2.696
19	5 37 31.59	2.2577	18 45 59.3	2.597
20	5 39 47.15	2.2611	18 48 32.2	2.498
21	5 42 2.92	2.2646	18 50 59.1	2.398
22	5 44 18.90	2.2680	18 53 20.0	2.297
23	5 46 35.08	2.2713	18 55 34.8	2.197
24	5 48 51.46	2.2747	N.18 57 43.6	2.096

THURSDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	5 48 51.46	2.2747	N.18 57 43.6	2.096
1	5 51 8.04	2.2781	18 59 46.3	1.994
2	5 53 24.83	2.2815	19 1 42.8	1.891
3	5 55 41.82	2.2847	19 3 33.2	1.788
4	5 57 59.00	2.2880	19 5 17.4	1.684
5	6 0 16.38	2.2913	19 6 55.3	1.579
6	6 2 33.96	2.2946	19 8 26.9	1.474
7	6 4 51.73	2.2977	19 9 52.2	1.369
8	6 7 9.69	2.3008	19 11 11.2	1.264
9	6 9 27.83	2.3039	19 12 23.9	1.158
10	6 11 46.16	2.3070	19 13 30.2	1.051
11	6 14 4.67	2.3101	19 14 30.0	0.944
12	6 16 23.37	2.3132	19 15 23.4	0.836
13	6 18 42.25	2.3162	19 16 10.3	0.727
14	6 21 1.31	2.3192	19 16 50.7	0.618
15	6 23 20.55	2.3221	19 17 24.5	0.509
16	6 25 39.96	2.3249	19 17 51.8	0.400
17	6 27 59.54	2.3278	19 18 12.5	0.289
18	6 30 19.30	2.3306	19 18 26.5	0.178
19	6 32 39.22	2.3334	19 18 33.9	+0.068
20	6 34 59.31	2.3362	19 18 34.7	−0.043
21	6 37 19.57	2.3390	19 18 28.8	0.154
22	6 39 39.99	2.3416	19 18 16.2	0.267
23	6 42 0.56	2.3442	N.19 17 56.8	0.380

FRIDAY, APRIL 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	6 44 21.29	2.3467	N.19 17 30.6	0.493

PHASES OF THE MOON.

		d	h	m
☽ First Quarter	Mar.	2	13	7.7
○ Full Moon	. . . .	9	8	33.9
☾ Last Quarter	. . . .	16	1	42.1
● New Moon	. . . .	24	4	9.7

		d	h
☾ Perigee	. . . . Mar.	9	12.1
☾ Apogee	. . . . . .	23	6.7

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Sun	W.	72° 9′ 22″	3263	73° 34′ 17″	3250	74° 59′ 27″	3236	76° 24′ 53″	3223
	Venus	W.	51 8 32	3355	52 31 40	3342	53 55 3	3328	55 18 42	3315
	α Arietis	W.	22 29 25	4108	23 39 19	3956	24 51 42	3825	26 6 18	3712
	Saturn	E.	53 17 21	2898	51 44 59	2886	50 12 22	2874	48 39 30	2862
	Pollux	E.	60 2 53	2981	58 32 16	2973	57 1 29	2964	55 30 31	2954
	Regulus	E.	95 35 10	2894	94 2 44	2883	92 30 3	2871	90 57 7	2859
2	Sun	W.	83 36 11	3150	85 3 20	3133	86 30 49	3118	87 58 37	3101
	Venus	W.	62 21 3	3240	63 46 25	3224	65 12 6	3208	66 38 6	3190
	α Arietis	W.	32 45 0	3321	34 8 47	3265	35 33 40	3213	36 59 34	3166
	Saturn	E.	40 51 21	2801	39 16 54	2788	37 42 10	2775	36 7 9	2761
	Pollux	E.	47 52 51	2911	46 20 46	2903	44 48 31	2895	43 16 6	2888
	Regulus	E.	83 8 18	2791	81 33 38	2776	79 58 39	2762	78 23 21	2747
3	Sun	W.	95 22 48	3014	96 52 44	2995	98 23 3	2976	99 53 46	2958
	Venus	W.	73 53 21	3101	75 21 30	3082	76 50 1	3063	78 18 56	3043
	α Arietis	W.	44 22 8	2970	45 52 58	2937	47 24 30	2905	48 56 43	2873
	Pollux	E.	35 32 6	2866	33 59 4	2868	32 26 4	2872	30 53 9	2878
	Regulus	E.	70 21 38	2666	68 44 12	2648	67 6 22	2631	65 28 9	2613
4	Sun	W.	107 33 22	2860	109 6 32	2839	110 40 9	2819	112 14 12	2799
	Venus	W.	85 49 36	2943	87 21 0	2924	88 52 49	2903	90 25 4	2882
	α Arietis	W.	56 47 22	2733	58 23 18	2707	59 59 49	2681	61 36 54	2656
	Aldebaran	W.	22 57 46	2523	24 38 27	2504	26 19 34	2485	28 1 8	2467
	Regulus	E.	57 10 59	2523	55 30 18	2504	53 49 10	2485	52 7 36	2467
5	Sun	W.	120 11 4	2698	121 47 47	2678	123 24 57	2657	125 2 34	2638
	α Arietis	W.	69 50 35	2539	71 30 54	2517	73 11 44	2494	74 53 5	2473
	Aldebaran	W.	36 35 37	2372	38 19 52	2353	40 4 34	2335	41 49 43	2316
	Regulus	E.	43 33 8	2373	41 48 54	2353	40 4 12	2335	38 19 3	2316
	Spica	E.	97 14 35	2399	95 30 59	2380	93 46 55	2360	92 2 24	2343
6	Aldebaran	W.	50 42 11	2226	52 30 0	2209	54 18 14	2192	56 6 54	2175
	Spica	E.	83 13 12	2253	81 26 3	2236	79 38 29	2220	77 50 31	2203
	Jupiter	E.	96 37 6	2220	94 49 8	2202	93 0 44	2186	91 11 55	2169
7	Aldebaran	W.	65 16 17	2099	67 7 18	2085	68 58 40	2072	70 50 23	2059
	Saturn	W.	27 50 57	2128	29 41 13	2111	31 31 56	2094	33 23 4	2079
	Spica	E.	68 44 47	2130	66 54 33	2116	65 3 59	2105	63 13 7	2093
	Jupiter	E.	82 1 45	2092	80 10 34	2079	78 19 2	2066	76 27 10	2053
8	Aldebaran	W.	80 13 31	2005	82 6 57	1997	84 0 36	1989	85 54 28	1981
	Saturn	W.	42 44 5	2017	44 37 12	2007	46 30 35	1999	48 24 11	1991
	Pollux	W.	37 14 16	2176	39 3 19	2154	40 52 56	2135	42 43 2	2117
	Spica	E.	53 54 42	2047	52 2 21	2041	50 9 50	2035	48 17 10	2031
	Jupiter	E.	67 3 14	2000	65 9 40	1991	63 15 52	1983	61 21 51	1976
	Antares	E.	99 46 17	2070	97 54 32	2061	96 2 32	2052	94 10 19	2044
9	Saturn	W.	57 54 54	1963	59 49 26	1961	61 44 2	1960	63 38 40	1958
	Pollux	W.	51 59 15	2057	53 51 20	2050	55 43 36	2045	57 36 0	2041
	Spica	E.	38 52 47	2028	36 59 56	2032	35 7 12	2038	33 14 37	2046
	Jupiter	E.	51 49 31	1954	49 54 44	1953	47 59 55	1952	46 5 5	1952

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Sun	W.	77 50 35	3309	79 16 33	3195	80 42 48	3181	82 9 20	3165
	Venus	W.	56 42 36	3300	58 6 47	3286	59 31 15	3271	60 56 0	3256
	α Arietis	W.	27 22 52	3614	28 41 11	3527	30 1 5	3451	31 22 24	3383
	Saturn	E.	47 6 23	2851	45 33 1	2839	43 59 24	2827	42 25 31	2814
	Pollux	E.	53 59 21	2946	52 28 0	2937	50 56 28	2928	49 24 45	2920
	Regulus	E.	89 23 55	2846	87 50 27	2833	86 16 42	2819	84 42 39	2805
2	Sun	W.	89 26 45	3084	90 55 14	3067	92 24 4	3050	93 53 15	3032
	Venus	W.	68 4 27	3173	69 31 8	3155	70 58 11	3138	72 25 35	3119
	α Arietis	W.	38 26 24	3122	39 54 7	3081	41 22 40	3042	42 52 1	3005
	Saturn	E.	34 31 50	2747	32 56 13	2734	31 20 38	2721	29 44 6	2708
	Pollux	E.	41 43 32	2882	40 10 50	2876	38 38 1	2872	37 5 6	2868
	Regulus	E.	76 47 43	2731	75 11 44	2715	73 35 24	2698	71 58 42	2682
3	Sun	W.	101 24 52	2939	102 56 22	2919	104 28 17	2899	106 0 37	2880
	Venus	W.	79 48 15	3024	81 17 58	3004	82 48 6	2985	84 18 38	2964
	α Arietis	W.	50 29 36	2844	52 3 7	2815	53 37 16	2787	55 12 1	2760
	Pollux	E.	29 20 22	2888	27 47 48	2905	26 15 35	2927	24 43 51	2960
	Regulus	E.	63 49 32	2595	62 10 30	2577	60 31 4	2560	58 51 14	2542
4	Sun	W.	113 48 41	2779	115 23 37	2759	116 58 59	2738	118 34 48	2718
	Venus	W.	91 57 46	2862	93 30 54	2841	95 4 29	2820	96 58 31	2800
	α Arietis	W.	63 14 33	2652	64 52 45	2607	66 31 30	2584	68 10 47	2561
	Aldebaran	W.	29 43 8	2448	31 25 35	2429	33 8 29	2410	34 51 49	2391
	Regulus	E.	50 25 36	2448	48 43 9	2429	47 0 15	2410	45 16 55	2391
5	Sun	W.	126 40 38	2618	128 19 8	2599	129 58 5	2580	131 37 28	2561
	α Arietis	W.	76 34 56	2453	78 17 16	2433	80 0 4	2412	81 43 21	2394
	Aldebaran	W.	43 35 19	2298	45 21 22	2279	47 7 52	2262	48 54 48	2243
	Regulus	E.	36 33 27	2298	34 47 24	2280	33 0 55	2262	31 13 59	2243
	Spica	E.	90 17 27	2324	88 32 3	2306	86 46 12	2288	84 59 55	2270
6	Aldebaran	W.	57 55 59	2159	59 45 28	2143	61 35 21	2128	63 25 38	2113
	Spica	E.	76 2 8	2188	74 13 22	2172	72 24 12	2157	70 34 40	2143
	Jupiter	E.	89 22 41	2153	87 33 2	2137	85 43 0	2122	83 52 31	2107
7	Aldebaran	W.	72 42 25	2048	74 34 45	2036	76 27 23	2025	78 20 19	2014
	Saturn	W.	35 14 35	2065	37 6 28	2052	38 58 42	2039	40 51 15	2028
	Spica	E.	61 21 57	2082	59 30 30	2072	57 38 48	2062	55 46 51	2055
	Jupiter	E.	74 34 58	2041	72 42 27	2030	70 49 39	2019	68 56 34	2009
8	Aldebaran	W.	87 48 32	1975	89 42 46	1969	91 37 9	1965	93 31 39	1961
	Saturn	W.	50 18 0	1984	52 12 0	1977	54 6 10	1972	56 0 28	1967
	Pollux	W.	44 33 35	2101	46 24 32	2088	48 15 49	2077	50 7 24	2066
	Spica	E.	46 24 24	2028	44 31 33	2025	42 38 38	2025	40 45 42	2025
	Jupiter	E.	59 27 39	1970	57 33 18	1965	55 38 49	1961	53 44 13	1957
	Antares	E.	92 17 54	2038	90 25 19	2032	88 32 35	2028	86 39 44	2024
9	Saturn	W.	65 33 20	1958	67 28 1	1958	69 22 41	1960	71 17 18	1962
	Pollux	W.	59 28 31	2037	61 21 8	2035	63 13 48	2033	65 6 30	2033
	Spica	E.	31 22 15	2057	29 30 9	2071	27 38 25	2089	25 47 9	2112
	Jupiter	E.	44 10 15	1953	42 15 26	1955	40 20 40	1958	38 25 59	1962

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
9	Antares	E.	84° 46′ 47″	2021	82° 53′ 46″	2019	81° 0′ 42″	2018	79° 7′ 36″	2017
10	Saturn	W.	73 11 52	1965	75 6 21	1970	77 0 43	1975	78 54 57	1980
	Pollux	W.	66 59 12	2035	68 51 52	2037	70 44 29	2040	72 37 1	2044
	Regulus	W.	30 36 1	1961	32 30 37	1965	34 25 6	1970	36 19 27	1975
	Jupiter	E.	36 31 25	1967	34 36 59	1973	32 42 43	1980	30 48 38	1990
	Antares	E.	69 42 37	2033	67 49 54	2039	65 57 21	2046	64 4 59	2055
11	Saturn	W.	88 23 33	2019	90 16 37	2030	92 9 25	2041	94 1 56	2052
	Regulus	W.	45 48 38	2016	47 41 48	2025	49 34 43	2036	51 27 21	2047
	Antares	E.	54 46 54	2112	52 56 13	2127	51 5 55	2143	49 16 2	2161
12	Regulus	W.	60 45 52	2113	62 36 32	2127	64 26 50	2142	66 16 45	2157
	Antares	E.	40 13 57	2272	38 27 16	2300	36 41 17	2331	34 56 2	2364
	Sun	E.	142 24 29	2421	140 41 25	2437	138 58 43	2453	137 16 23	2469
13	Regulus	W.	75 20 20	2240	77 7 48	2258	78 54 50	2275	80 41 26	2293
	Spica	W.	22 27 25	2414	24 10 39	2409	25 54 1	2408	27 37 24	2412
	α Aquilæ	E.	75 49 48	2772	74 14 43	2799	72 40 14	2828	71 6 22	2857
	Sun	E.	128 50 37	2557	127 10 43	2575	125 31 14	2593	123 52 10	2612
14	Regulus	W.	89 27 52	2384	91 11 50	2402	92 55 22	2420	94 38 28	2439
	Spica	W.	36 12 7	2458	37 54 20	2470	39 36 15	2484	41 17 51	2497
	Jupiter	W.	22 58 16	2409	24 41 38	2422	26 24 42	2435	28 7 27	2450
	α Aquilæ	E.	63 27 8	3029	61 57 31	3069	60 28 43	3110	59 0 45	3153
	Fomalhaut	E.	96 4 14	2674	94 26 59	2691	92 50 7	2708	91 13 38	2726
	Sun	E.	115 43 24	2710	114 6 57	2730	112 30 57	2750	110 55 23	2769
15	Spica	W.	49 40 45	2574	51 20 16	2590	52 59 25	2605	54 38 13	2621
	Jupiter	W.	36 35 54	2527	38 16 30	2543	39 56 44	2559	41 36 35	2575
	α Aquilæ	E.	51 54 56	3411	50 32 52	3473	49 11 58	3539	47 52 17	3610
	Fomalhaut	E.	83 17 21	2822	81 43 22	2842	80 9 49	2863	78 36 43	2883
	Sun	E.	103 4 0	2867	101 30 59	2887	99 58 23	2905	98 26 11	2924
16	Spica	W.	62 46 51	2698	64 23 33	2714	65 59 54	2729	67 35 55	2744
	Jupiter	W.	49 50 23	2654	51 28 5	2669	53 5 26	2684	54 42 27	2699
	Fomalhaut	E.	70 58 0	2993	69 27 39	3017	67 57 47	3040	66 28 24	3065
	Sun	E.	90 51 3	3015	89 21 9	3032	87 51 36	3050	86 22 25	3066
17	Spica	W.	75 31 16	2814	77 5 26	2827	78 39 19	2840	80 12 55	2852
	Jupiter	W.	62 42 44	2769	64 17 53	2782	65 52 44	2795	67 27 19	2807
	Antares	W.	30 36 37	3027	32 6 16	3020	33 36 4	3016	35 5 57	3014
	Fomalhaut	E.	59 9 1	3193	57 42 43	3220	56 16 58	3249	54 51 47	3280
	α Pegasi	E.	73 52 14	3129	72 24 40	3149	70 57 30	3169	69 30 44	3189
	Sun	E.	79 1 28	3145	77 34 13	3160	76 7 16	3175	74 40 37	3189
18	Spica	W.	87 57 1	2911	89 29 6	2922	91 0 57	2932	92 32 35	2942
	Jupiter	W.	75 16 20	2865	76 49 24	2875	78 22 15	2885	79 54 53	2894
	Antares	W.	42 35 33	3021	44 5 20	3023	45 35 4	3026	47 4 44	3030
	Fomalhaut	E.	47 55 9	3452	46 33 51	3493	45 13 19	3536	43 53 35	3582
	α Pegasi	E.	62 23 3	3297	60 58 48	3320	59 35 0	3344	58 11 39	3369
	Sun	E.	67 31 24	3253	66 6 18	3265	64 41 26	3277	63 16 48	3288

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
9	Antares	E.	77° 14′ 29″	2019	75° 21′ 24″	2021	73° 28′ 23″	2025	71° 35′ 27″	2028
10	SATURN	W.	80 49 3	1986	82 42 59	1994	84 36 43	2001	86 30 15	2010
	Pollux	W.	74 29 26	2050	76 21 43	2055	78 13 51	2062	80 5 48	2071
	Regulus	W.	38 13 40	1982	40 7 43	1989	42 1 34	1997	43 55 13	2006
	JUPITER	E.	28 54 48	2000	27 1 14	2012	25 7 58	2026	23 15 4	2042
	Antares	E.	62 12 50	2064	60 20 56	2074	58 29 17	2086	56 37 56	2098
11	SATURN	W.	95 54 9	2064	97 46 3	2077	99 37 38	2090	101 28 53	2103
	Regulus	W.	53 19 42	2059	55 11 44	2072	57 3 27	2085	58 54 50	2098
	Antares	E.	47 26 35	2180	45 37 37	2200	43 49 10	2223	42 1 16	2246
12	Regulus	W.	68 6 17	2173	69 55 25	2190	71 44 8	2206	73 32 27	2223
	Antares	E.	33 11 36	2401	31 28 3	2442	29 45 28	2489	28 3 59	2541
	SUN	E.	135 34 26	2485	133 52 52	2502	132 11 42	2520	130 30 57	2538
13	Regulus	W.	82 27 36	2311	84 13 20	2329	85 58 37	2347	87 43 28	2366
	Spica	W.	29 20 42	2417	31 3 52	2425	32 46 51	2434	34 29 37	2445
	α Aquilæ	E.	69 33 8	2888	68 0 34	2920	66 28 41	2955	64 57 32	2991
	SUN	E.	122 13 32	2632	120 35 21	2652	118 57 36	2671	117 20 17	2690
14	Regulus	W.	96 21 7	2458	98 3 20	2475	99 45 8	2494	101 26 30	2512
	Spica	W.	42 59 8	2512	44 40 4	2527	46 20 39	2543	48 0 53	2559
	JUPITER	W.	29 49 51	2465	31 31 54	2480	33 13 36	2495	34 54 56	2511
	α Aquilæ	E.	57 33 40	3199	56 7 30	3248	54 42 18	3300	53 18 6	3353
	Fomalhaut	E.	89 37 33	2745	88 1 53	2763	86 26 37	2782	84 51 46	2802
	SUN	E.	109 20 15	2789	107 45 33	2809	106 11 17	2828	104 37 26	2848
15	Spica	W.	56 16 39	2637	57 54 44	2653	59 32 27	2669	61 9 49	2684
	JUPITER	W.	43 16 4	2591	44 55 11	2607	46 33 56	2623	48 12 20	2638
	α Aquilæ	E.	46 33 53	3685	45 16 50	3766	44 1 12	3854	42 47 5	3949
	Fomalhaut	E.	77 4 3	2905	75 31 51	2927	74 0 6	2949	72 28 49	2971
	SUN	E.	96 54 23	2942	95 22 58	2962	93 51 57	2980	92 21 19	2997
16	Spica	W.	69 11 37	2758	70 47 0	2772	72 22 4	2787	73 56 49	2801
	JUPITER	W.	56 19 8	2714	57 55 29	2728	59 31 32	2741	61 7 17	2755
	Fomalhaut	E.	64 59 31	3089	63 31 8	3114	62 3 15	3138	60 35 52	3165
	SUN	E.	84 53 34	3082	83 25 3	3099	81 56 52	3115	80 29 1	3130
17	Spica	W.	81 46 15	2865	83 19 19	2876	84 52 8	2888	86 24 42	2900
	JUPITER	W.	69 1 38	2819	70 35 41	2831	72 9 29	2842	73 43 2	2854
	Antares	W.	36 35 53	3013	38 5 50	3013	39 35 47	3014	41 5 42	3018
	Fomalhaut	E.	53 27 12	3311	52 3 13	3344	50 39 52	3378	49 17 10	3414
	α Pegasi	E.	68 4 22	3209	66 38 24	3231	65 12 51	3253	63 47 44	3275
	SUN	E.	73 14 15	3203	71 48 9	3216	70 22 19	3229	68 56 44	3241
18	Spica	W.	94 4 1	2951	95 35 15	2961	97 6 17	2970	98 37 7	2980
	JUPITER	W.	81 27 19	2904	82 59 33	2913	84 31 35	2922	86 3 26	2931
	Antares	W.	48 34 19	3035	50 3 48	3040	51 33 11	3045	53 2 28	3049
	Fomalhaut	E.	42 34 41	3632	41 16 41	3686	39 59 39	3745	38 43 39	3809
	α Pegasi	E.	56 48 47	3394	55 26 24	3422	54 4 32	3450	52 43 12	3479
	SUN	E.	61 52 23	3299	60 28 10	3309	59 4 9	3319	57 40 20	3329

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
19	**Jupiter**	W.	87° 35′ 6″	2939	89° 6′ 36″	2946	90° 37′ 56″	2954	92° 9′ 7″	2961
	Antares	W.	54 31 40	3054	56 0 46	3058	57 29 47	3063	58 58 42	3068
	α Pegasi	E.	51 22 25	3510	50 2 12	3544	48 42 36	3578	47 23 38	3616
	Sun	E.	56 16 42	3338	54 53 15	3348	53 29 59	3356	52 6 52	3365
20	**Jupiter**	W.	99 42 54	2992	101 13 17	2997	102 43 33	3002	104 13 43	3006
	Antares	W.	66 21 54	3089	67 50 17	3093	69 18 35	3096	70 46 49	3100
	α Pegasi	E.	40 59 52	3850	39 45 41	3910	38 32 31	3975	37 20 27	4048
	Sun	E.	45 13 34	3401	43 51 19	3408	42 29 11	3415	41 7 11	3490
21	Antares	W.	78 7 0	3115	79 34 51	3118	81 2 39	3120	82 30 24	3122
	α Aquilæ	W.	38 19 26	4626	39 21 26	4532	40 24 52	4446	41 29 32	4368
	Sun	E.	34 18 45	3447	32 57 22	3453	31 36 5	3457	30 14 53	3463
22	Antares	W.	89 48 34	3132	91 16 5	3133	92 43 35	3133	94 11 4	3134
	α Aquilæ	W.	47 8 37	4076	48 19 2	4031	49 30 11	3990	50 42 0	3953
	Sun	E.	23 30 19	3489	22 9 43	3496	20 49 14	3503	19 28 53	3511
26	**Sun**	W.	20 22 39	3447	21 44 2	3438	23 5 36	3429	24 27 20	3421
	Aldebaran	E.	42 36 52	3025	41 7 10	3021	39 37 23	3017	38 7 31	3012
	Saturn	E.	80 13 49	3039	78 44 24	3034	77 14 54	3030	75 45 19	3026
	Pollux	E.	86 45 53	3087	85 17 28	3083	83 48 58	3079	82 20 23	3076
27	**Sun**	W.	31 18 21	3380	32 41 0	3372	34 3 48	3364	35 26 46	3356
	Aldebaran	E.	30 36 40	2986	29 6 10	2981	27 35 33	2975	26 4 49	2969
	Saturn	E.	68 15 59	3001	66 45 48	2997	65 15 31	2991	63 45 7	2965
	Pollux	E.	74 56 12	3053	73 27 5	3049	71 57 53	3044	70 28 35	3039
28	**Sun**	W.	42 23 54	3314	43 47 49	3306	45 11 54	3296	46 36 10	3288
	Saturn	E.	56 11 9	2952	54 39 56	2946	53 8 35	2939	51 37 5	2931
	Pollux	E.	63 0 31	3014	61 30 35	3008	60 0 32	3003	58 30 23	2997
	Regulus	E.	98 37 30	2934	97 5 54	2927	95 34 9	2919	94 2 14	2910
29	**Sun**	W.	53 40 18	3236	55 5 44	3226	56 31 22	3214	57 57 14	3204
	α Arietis	W.	29 54 25	3495	31 14 55	3431	32 36 36	3374	33 59 22	3323
	Venus	W.	26 23 42	3386	27 46 14	3370	29 9 5	3353	30 32 15	3337
	Saturn	E.	43 57 4	2890	42 24 32	2881	40 51 49	2873	39 18 55	2864
	Pollux	E.	50 58 0	2972	49 27 12	2967	47 56 18	2963	46 25 19	2959
	Regulus	E.	86 19 57	2866	84 46 55	2856	83 13 40	2846	81 40 12	2836
30	**Sun**	W.	65 10 2	3142	66 37 21	3129	68 4 55	3116	69 32 45	3102
	α Arietis	W.	41 6 30	3124	42 34 11	3091	44 2 31	3062	45 31 27	3034
	Venus	W.	37 32 38	3260	38 57 36	3245	40 22 52	3229	41 48 27	3214
	Saturn	E.	31 31 31	2818	29 57 27	2809	28 23 11	2800	26 48 43	2792
	Pollux	E.	38 49 19	2948	37 18 1	2948	35 46 43	2950	34 15 28	2954
	Regulus	E.	73 49 27	2781	72 14 34	2769	70 39 25	2756	69 4 0	2744
31	**Sun**	W.	76 56 14	3030	78 25 50	3014	79 55 45	2999	81 25 59	2983
	α Arietis	W.	53 4 35	2906	54 36 46	2883	56 9 27	2860	57 42 37	2838
	Venus	W.	49 1 2	3133	50 28 31	3117	51 56 20	3101	53 24 29	3083
	Aldebaran	W.	19 6 15	2678	20 43 24	2664	22 20 52	2649	23 58 40	2635
	Regulus	E.	61 2 40	2678	59 25 30	2663	57 48 1	2649	56 10 13	2636

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
19	JUPITER	W.	93° 40′ 9″	2968	95° 11′ 2″	2974	96° 41′ 47″	2981	98° 12′ 24″	2986
	Antares	W.	60 27 31	3072	61 56 15	3077	63 24 53	3081	64 53 26	3085
	α Pegasi	E.	46 5 21	3656	44 47 47	3699	43 30 59	3745	42 14 59	3796
	SUN	E.	50 43 55	3372	49 21 7	3360	47 58 28	3387	46 35 57	3394
20	JUPITER	W.	105 43 48	3011	107 13 47	3016	108 43 40	3020	110 13 28	3023
	Antares	W.	72 14 59	3103	73 43 5	3106	75 11 7	3110	76 39 5	3112
	α Pegasi	E.	36 9 35	4129	35 0 1	4218	33 51 52	4318	32 45 16	4431
	SUN	E.	39 45 17	3426	38 23 30	3431	37 1 49	3437	35 40 14	3442
21	Antares	W.	83 58 7	3124	85 25 47	3126	86 53 25	3128	88 21 1	3130
	α Aquilæ	W.	42 35 22	4297	43 42 17	4234	44 50 11	4177	45 58 59	4125
	SUN	E.	28 53 47	3467	27 32 46	3472	26 11 51	3478	24 51 2	3483
22	Antares	W.	95 38 32	3136	97 5 58	3137	98 33 23	3138	100 0 46	3139
	α Aquilæ	W.	51 54 26	3919	53 7 27	3887	54 21 0	3858	55 35 2	3832
	SUN	E.	18 8 41	3521	16 48 40	3534	15 28 53	3550	14 9 24	3570
26	SUN	W.	25 49 13	3412	27 11 16	3403	28 33 29	3395	29 55 51	3388
	Aldebaran	E.	36 37 33	3007	35 7 29	3002	33 37 19	2997	32 7 3	2992
	SATURN	E.	74 15 39	3022	72 45 53	3017	71 16 1	3012	69 46 3	3007
	Pollux	E.	80 51 44	3072	79 23 0	3067	77 54 10	3062	76 25 14	3057
27	SUN	W.	36 49 53	3348	38 13 9	3340	39 36 34	3332	41 0 9	3323
	Aldebaran	E.	24 33 58	2962	23 2 58	2956	21 31 50	2950	20 0 34	2942
	SATURN	E.	62 14 35	2978	60 43 55	2973	59 13 8	2966	57 42 13	2959
	Pollux	E.	68 59 11	3034	67 29 41	3029	66 0 4	3024	64 30 21	3018
28	SUN	W.	48 0 36	3278	49 25 13	3268	50 50 2	3257	52 15 4	3247
	SATURN	E.	50 5 25	2923	48 33 35	2915	47 1 35	2907	45 29 25	2898
	Pollux	E.	57 0 7	2993	55 29 45	2987	53 59 16	2982	52 28 41	2977
	Regulus	E.	92 30 8	2902	90 57 52	2894	89 25 25	2885	87 52 47	2876
29	SUN	W.	59 23 19	3192	60 49 38	3180	62 16 11	3168	63 42 59	3155
	α Arietis	W.	35 23 7	3276	36 47 46	3234	38 13 15	3194	39 39 31	3158
	VENUS	W.	31 55 44	3321	33 19 31	3306	34 43 36	3291	36 7 58	3276
	SATURN	E.	37 45 50	2855	36 12 33	2845	34 39 4	2836	33 5 23	2828
	Pollux	E.	44 54 15	2955	43 23 6	2952	41 51 53	2950	40 20 37	2948
	Regulus	E.	80 6 31	2826	78 32 37	2815	76 58 28	2804	75 24 5	2792
30	SUN	W.	71 0 52	3088	72 29 16	3074	73 57 57	3060	75 26 56	3044
	α Arietis	W.	47 0 58	3005	48 31 4	2979	50 1 43	2954	51 32 54	2930
	VENUS	W.	43 14 20	3198	44 40 32	3182	46 7 3	3166	47 33 53	3150
	SATURN	E.	25 14 4	2784	23 39 15	2777	22 4 17	2772	20 29 12	2768
	Pollux	E.	32 44 18	2961	31 13 16	2970	29 42 25	2982	28 11 50	2999
	Regulus	E.	67 28 19	2732	65 52 21	2718	64 16 5	2705	62 39 32	2691
31	SUN	W.	82 56 33	2967	84 27 27	2951	85 58 41	2935	87 30 16	2918
	α Arietis	W.	59 16 15	2817	60 50 21	2795	62 24 55	2774	63 59 57	2754
	VENUS	W.	54 52 59	3066	56 21 50	3049	57 51 2	3032	59 20 35	3014
	Aldebaran	W.	25 36 47	2621	27 15 14	2605	28 54 2	2590	30 33 11	2574
	Regulus	E.	54 32 5	2620	52 53 37	2605	51 14 49	2590	49 35 40	2574

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to / Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Frid.	1	0 42 6.22	9.098	N. 4 31 51.6	+57.85	16 2.13	64.51	3 58.70	0.756
Sat.	2	0 45 44.62	9.102	4 54 57.3	57.63	16 1.87	64.53	3 40.60	0.752
SUN.	3	0 49 23.12	9.107	5 17 57.7	57.40	16 1.60	64.55	3 22.60	0.747
Mon.	4	0 53 1.76	9.113	5 40 52.4	+57.16	16 1.33	64.57	3 4.73	0.741
Tues.	5	0 56 40.55	9.120	6 3 41.2	56.90	16 1.06	64.59	2 47.00	0.734
Wed.	6	1 0 19.50	9.127	6 26 23.7	56.63	16 0.79	64.62	2 29.45	0.727
Thur.	7	1 3 58.65	9.136	6 48 59.4	+56.35	16 0.52	64.65	2 12.11	0.718
Frid.	8	1 7 38.03	9.145	7 11 28.2	56.05	16 0.24	64.69	1 54.98	0.709
Sat.	9	1 11 17.64	9.156	7 33 49.7	55.74	15 59.97	64.72	1 38.08	0.698
SUN.	10	1 14 57.51	9.167	7 56 3.6	+55.41	15 59.69	64.76	1 21.45	0.687
Mon.	11	1 18 37.66	9.179	8 18 9.5	55.07	15 59.42	64.80	1 5.10	0.675
Tues.	12	1 22 18.12	9.192	8 40 7.2	54.72	15 59.14	64.85	0 49.05	0.662
Wed.	13	1 25 58.89	9.206	9 1 56.3	+54.36	15 58.87	64.89	0 33.30	0.648
Thur.	14	1 29 40.00	9.220	9 23 36.4	53.98	15 58.59	64.94	0 17.90	0.634
Frid.	15	1 33 21.47	9.235	9 45 7.2	53.59	15 58.32	64.99	0 2.86	0.619
Sat.	16	1 37 3.31	9.251	10 6 28.5	+53.18	15 58.04	65.05	0 11.81	0.603
SUN.	17	1 40 45.54	9.268	10 27 39.9	52.76	15 57.77	65.10	0 26.10	0.587
Mon.	18	1 44 28.17	9.285	10 48 41.1	52.33	15 57.50	65.16	0 39.99	0.570
Tues.	19	1 48 11.20	9.302	11 9 31.8	+51.88	15 57.23	65.22	0 53.48	0.553
Wed.	20	1 51 54.65	9.320	11 30 11.5	51.42	15 56.97	65.28	1 6.54	0.535
Thur.	21	1 55 38.54	9.338	11 50 39.9	50.94	15 56.71	65.34	1 19.17	0.517
Frid.	22	1 59 22.87	9.357	12 10 56.7	+50.45	15 56.45	65.40	1 31.35	0.498
Sat.	23	2 3 7.66	9.376	12 31 1.6	49.95	15 56.19	65.47	1 43.08	0.479
SUN.	24	2 6 52.91	9.396	12 50 54.2	49.43	15 55.94	65.54	1 54.36	0.459
Mon.	25	2 10 38.62	9.415	13 10 34.2	+48.89	15 55.69	65.61	2 5.18	0.440
Tues.	26	2 14 24.80	9.435	13 30 1.2	48.34	15 55.45	65.68	2 15.52	0.420
Wed.	27	2 18 11.47	9.455	13 49 14.9	47.79	15 55.21	65.75	2 25.37	0.400
Thur.	28	2 21 58.63	9.476	14 8 14.9	+47.21	15 54.97	65.83	2 34.73	0.379
Frid.	29	2 25 46.29	9.496	14 27 0.9	46.62	15 54.73	65.90	2 43.60	0.359
Sat.	30	2 29 34.45	9.517	14 45 32.5	46.01	15 54.50	65.98	2 51.97	0.338
SUN.	31	2 33 23.13	9.539	N.15 3 49.4	+45.40	15 54.27	66.05	2 59.83	0.316

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^{s}.18$ from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Subtracted from / Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Frid.	1	0 42 5.62	9.100	N. 4 31 47.7	+57.86	3 58.75	0.756	0 38 6.87
Sat.	2	0 45 44.06	9.104	4 54 53.8	57.64	3 40.64	0.752	0 42 3.42
SUN.	3	0 49 22.61	9.109	5 17 54.5	57.41	3 22.64	0.747	0 45 59.97
Mon.	4	0 53 1.29	9.115	5 40 49.5	+57.17	3 4.77	0.741	0 49 56.52
Tues.	5	0 56 40.12	9.122	6 3 38.6	56.91	2 47.04	0.734	0 53 53.08
Wed.	6	1 0 19.12	9.129	6 26 21.4	56.64	2 29.49	0.727	0 57 49.63
Thur.	7	1 3 58.32	9.138	6 48 57.4	+56.36	2 12.14	0.718	1 1 46.18
Frid.	8	1 7 37.74	9.147	7 11 26.4	56.06	1 55.01	0.709	1 5 42.73
Sat.	9	1 11 17.39	9.158	7 33 48.1	55.75	1 38.10	0.698	1 9 39.29
SUN.	10	1 14 57.30	9.169	7 56 2.3	+55.42	1 21.46	0.687	1 13 35.84
Mon.	11	1 18 37.50	9.181	8 18 8.5	55.08	1 5.11	0.675	1 17 32.39
Tues.	12	1 22 17.99	9.194	8 40 6.4	54.73	0 49.05	0.662	1 21 28.94
Wed.	13	1 25 58.80	9.208	9 1 55.7	+54.37	0 33.30	0.648	1 25 25.50
Thur.	14	1 29 39.95	9.222	9 23 36.1	53.99	0 17.90	0.634	1 29 22.05
Frid.	15	1 33 21.46	9.237	9 45 7.2	53.60	0 2.86	0.619	1 33 18.60
Sat.	16	1 37 3.34	9.253	10 6 28.7	+53.19	0 11.81	0.603	1 37 15.15
SUN.	17	1 40 45.60	9.269	10 27 40.3	52.77	0 26.10	0.587	1 41 11.71
Mon.	18	1 44 28.26	9.286	10 48 41.7	52.34	0 40.00	0.570	1 45 8.26
Tues.	19	1 48 11.33	9.303	11 9 32.6	+51.89	0 53.49	0.553	1 49 4.82
Wed.	20	1 51 54.82	9.321	11 30 12.5	51.43	1 6.55	0.535	1 53 1.37
Thur.	21	1 55 38.74	9.339	11 50 41.1	50.95	1 19.18	0.517	1 56 57.92
Frid.	22	1 59 23.11	9.358	12 10 58.1	+50.46	1 31.36	0.498	2 0 54.47
Sat.	23	2 3 7.93	9.377	12 31 3.1	49.96	1 43.09	0.479	2 4 51.03
SUN.	24	2 6 53.21	9.397	12 50 55.8	49.44	1 54.37	0.459	2 8 47.58
Mon.	25	2 10 38.95	9.416	13 10 35.9	+48.90	2 5.19	0.440	2 12 44.14
Tues.	26	2 14 25.16	9.436	13 30 3.0	48.35	2 15.53	0.420	2 16 40.69
Wed.	27	2 18 11.86	9.456	13 49 16.8	47.79	2 25.39	0.400	2 20 37.25
Thur.	28	2 21 59.05	9.477	14 8 16.9	+47.21	2 34.75	0.379	2 24 33.80
Frid.	29	2 25 46.73	9.497	14 27 3.0	46.62	2 43.62	0.359	2 28 30.35
Sat.	30	2 29 34.91	9.518	14 45 34.7	46.01	2 51.99	0.338	2 32 26.90
SUN.	31	2 33 23.61	9.540	N. 15 3 51.7	+45.40	2 59.85	0.316	2 36 23.46

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour, + $9^s.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	THE SUN'S Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	91	11 27 9.2	27 7.2	147.85	− 0.59	9.9999358	+ 50.9	23 18 3.47
2	92	12 26 16.6	26 14.5	147.76	0.48	0.0000579	50.9	23 14 7.57
3	93	13 25 21.8	25 19.6	147.66	0.35	0.0001802	51.0	23 10 11.66
4	94	14 24 24.7	24 22.4	147.57	− 0.22	0.0003028	+ 51.1	23 6 15.76
5	95	15 23 25.3	23 22.9	147.48	− 0.08	0.0004257	51.2	23 2 19.84
6	96	16 22 23.7	22 21.2	147.39	+ 0.05	0.0005488	51.3	22 58 23.93
7	97	17 21 20.1	21 17.5	147.30	+ 0.16	0.0006721	+ 51.4	22 54 28.02
8	98	18 20 14.4	20 11.7	147.22	0.25	0.0007958	51.6	22 50 32.12
9	99	19 19 6.7	19 3.9	147.14	0.31	0.0009198	51.7	22 46 36.21
10	100	20 17 57.0	17 54.1	147.06	+ 0.35	0.0010441	+ 51.8	22 42 40.30
11	101	21 16 45.4	16 42.4	146.98	0.36	0.0011686	51.8	22 38 44.39
12	102	22 15 32.1	15 29.0	146.91	0.33	0.0012931	51.8	22 34 48.49
13	103	23 14 17.1	14 13.9	146.83	+ 0.28	0.0014175	+ 51.8	22 30 52.59
14	104	24 13 0 3	12 57.0	146.76	0.20	0.0015417	51.7	22 26 56.68
15	105	25 11 41.8	11 38.4	146.69	+ 0.09	0.0016656	51.5	22 23 0.77
16	106	26 10 21.6	10 18.1	146.62	− 0.03	0.0017890	+ 51.3	22 19 4.86
17	107	27 8 59.8	8 56.2	146.55	0.16	0.0019116	50.9	22 15 8.96
18	108	28 7 36.3	7 32.6	146.48	0.29	0.0020333	50.5	22 11 13.05
19	109	29 6 11.1	6 7.3	146.41	− 0.41	0.0021541	+ 50.1	22 7 17.14
20	110	30 4 44.2	4 40.3	146.34	0.52	0.0022738	49.6	22 3 21.28
21	111	31 3 15.6	3 11.6	146.27	0.62	0.0023923	49.1	21 59 25.33
22	112	32 1 45.2	1 41.1	146.19	− 0.70	0.0025094	+ 48 5	21 55 29.42
23	113	33 0 12.9	0 8.7	146.11	0.76	0.0026250	47.9	21 51 33.51
24	114	33 58 38.7	58 34.4	146.03	0.78	0.0027392	47.3	21 47 37.60
25	115	34 57 2.6	56 58.2	145.95	− 0.77	0.0028520	+ 46.7	21 43 41.70
26	116	35 55 24.5	55 20.0	145.87	0.73	0.0029634	46.1	21 39 45.79
27	117	36 53 44.4	53 39.8	145.79	0.66	0.0030734	45.6	21 35 49.88
28	118	37 52 2.2	51 57.5	145.70	− 0.56	0.0031822	+ 45.1	21 31 53.98
29	119	38 50 18.0	50 13.2	145.61	0.45	0.0032898	44.6	21 27 58.07
30	120	39 48 31.8	48 26.8	145.52	0.32	0.0033962	44.1	21 24 2.17
31	121	40 46 43 5	46 38.4	145.44	− 0.19	0.0035016	+ 43.7	21 20 6.26

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January $0^d.0$.

Diff. for 1 Hour,
— $9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
							h m	m	d
1	15′ 41″.4	15′ 48″.2	57′ 28″.0	+2″.07	57′ 53″.3	+2″.13	6 20.1	2.28	7.8
2	15 55.3	16 2.4	58 19.1	2.16	58 45.2	2.17	7 15.5	2.33	8.8
3	16 9.4	16 16.3	59 11.1	2.13	59 36.2	2.03	8 11.7	2.34	9.8
4	16 22.7	16 28.6	59 59.8	+1.88	60 21.4	+1.68	9 8.0	2.34	10.8
5	16 33.7	16 37.9	60 40.2	1.43	60 55.6	1.12	10 4.0	2.33	11.8
6	16 41.0	16 42.9	61 7.0	+0.77	61 14.1	+0.39	10 59.7	2.32	12.8
7	16 43.5	16 42.8	61 16.4	−0.02	61 13.7	−0.43	11 55.3	2.32	13.8
8	16 40.8	16 37.4	61 6.2	0.82	60 54.0	1.19	12 51.0	2.32	14.8
9	16 33.0	16 27.5	60 37.6	1.53	60 17.4	1.82	13 46.9	2.33	15.8
10	16 21.1	16 14.1	59 54.0	−2.05	59 28.2	−2.23	14 42.9	2.33	16.8
11	16 6.6	15 58.7	59 0.6	2.35	58 31.9	2.41	15 38.6	2.31	17.8
12	15 50.9	15 43.0	58 2.9	2.41	57 34.1	2.37	16 33.4	2.25	18.8
13	15 35.4	15 28.1	57 6.0	−2.29	56 39.2	−2.17	17 26.6	2.17	19.8
14	15 21.2	15 14.8	56 13.9	2.03	55 50.5	1.86	18 17.7	2.08	20.8
15	15 9.0	15 3.8	55 29.2	1.68	55 10.1	1.50	19 6.4	1.98	21.8
16	14 59.2	14 55.3	54 53.3	−1.30	54 38.9	−1.11	19 52.9	1.89	22.8
17	14 52.0	14 49.4	54 26.8	0.91	54 17.1	0.71	20 37.5	1.82	23.8
18	14 47.4	14 45.9	54 9.7	0.53	54 4.4	0.35	21 20.6	1.77	24.8
19	14 45.0	14 44.7	54 1.2	−0.18	54 0.0	−0.03	22 2.8	1.75	25.8
20	14 44.9	14 45.5	54 0.5	+0.11	54 2.7	+0.25	22 44.8	1.75	26.8
21	14 46.5	14 47.9	54 6.5	0.38	54 11.7	0.49	23 27.2	1.79	27.8
22	14 49.7	14 51.8	54 18.2	+0.59	54 25.9	+0.69	☌		28.8
23	14 54.2	14 56.8	54 34.7	0.78	54 44.5	0.86	0 10.6	1.84	0.1
24	14 59.8	15 3.0	54 55.3	0.94	55 7.0	1.01	0 55.5	1.91	1.1
25	15 6.4	15 10.0	55 19.5	+1.08	55 33.0	+1.16	1 42.4	2.00	2.1
26	15 14.0	15 18.1	55 47.4	1.23	56 2.6	1.30	2 31.5	2.09	3.1
27	15 22.5	15 27.1	56 18.6	1.37	56 35.5	1.44	3 22.7	2.18	4.1
28	15 31.9	15 36.9	56 53.2	+1.51	57 11.7	+1.57	4 15.7	2.24	5.1
29	15 42.1	15 47.5	57 30.9	1.62	57 50.6	1.66	5 9.8	2.27	6.1
30	15 53.0	15 58.5	58 10.7	1.68	58 30.9	1.68	6 4.3	2.27	7.1
31	16 3.9	16 9.3	58 51.0	+1.66	59 10.6	+1.60	6 58.8	2.26	8.1

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 44 21.29	2.3467	N.19 17 30.6	0.493
1	6 46 42.17	2.3493	19 16 57.6	0.606
2	6 49 3.21	2.3519	19 16 17.9	0.718
3	6 51 24.40	2.3544	19 15 31.4	0.832
4	6 53 45.73	2.3568	19 14 38.0	0.947
5	6 56 7.21	2.3592	19 13 37.8	1.061
6	6 58 28.83	2.3615	19 12 30.7	1.176
7	7 0 50.59	2.3638	19 11 16.7	1.291
8	7 3 12.49	2.3661	19 9 55.8	1.406
9	7 5 34.52	2.3683	19 8 28.0	1.522
10	7 7 56.68	2.3704	19 6 53.2	1.637
11	7 10 18.97	2.3726	19 5 11.5	1.753
12	7 12 41.39	2.3747	19 3 22.8	1.870
13	7 15 3.93	2.3767	19 1 27.1	1.987
14	7 17 26.59	2.3787	18 59 24.4	2.103
15	7 19 49.37	2.3807	18 57 14.8	2.219
16	7 22 12.27	2.3826	18 54 58.2	2.336
17	7 24 35.28	2.3844	18 52 34.5	2.453
18	7 26 58.40	2.3862	18 50 3.8	2.570
19	7 29 21.63	2.3880	18 47 26.1	2.687
20	7 31 44.96	2.3897	18 44 41.3	2.805
21	7 34 8.40	2.3914	18 41 49.5	2.922
22	7 36 31.93	2.3930	18 38 50.6	3.040
23	7 38 55.56	2.3946	N.18 35 44.7	3.157

SATURDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 41 19.29	2.3962	N.18 32 31.8	3.274
1	7 43 43.11	2.3977	18 29 11.8	3.392
2	7 46 7.01	2.3991	18 25 44.7	3.510
3	7 48 31.00	2.4006	18 22 10.6	3.627
4	7 50 55.08	2.4019	18 18 29.4	3.745
5	7 53 19.23	2.4032	16 14 41.2	3.862
6	7 55 43.46	2.4045	18 10 46.0	3.979
7	7 58 7.77	2.4057	18 6 43.7	4.096
8	8 0 32.15	2.4068	18 2 34.4	4.213
9	8 2 56.59	2.4079	17 58 18.1	4.331
10	8 5 21.10	2.4090	17 53 54.7	4.448
11	8 7 45.67	2.4101	17 49 24.3	4.565
12	8 10 10.31	2.4111	17 44 46.9	4.682
13	8 12 35.00	2.4120	17 40 2.5	4.798
14	8 14 59.75	2.4130	17 35 11.1	4.914
15	8 17 24.56	2.4139	17 30 12.8	5.029
16	8 19 49.42	2.4147	17 25 7.6	5.145
17	8 22 14.33	2.4155	17 19 55.4	5.261
18	8 24 39.28	2.4162	17 14 36.2	5.377
19	8 27 4.27	2.4168	17 9 10.1	5.492
20	8 29 29.30	2.4175	17 3 37.2	5.606
21	8 31 54.37	2.4182	16 57 57.4	5.720
22	8 34 19.48	2.4189	16 52 10.8	5.834
23	8 36 44.63	2.4194	16 46 17.3	5.948
24	8 39 9.81	2.4198	N.16 40 17.0	6.061

SUNDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 39 9.81	2.4198	N.16 40 17.0	6.061
1	8 41 35.01	2.4203	16 34 9.9	6.174
2	8 44 0.24	2.4207	16 27 56.1	6.287
3	8 46 25.49	2.4210	16 21 35.5	6.399
4	8 48 50.76	2.4214	16 15 8.2	6.511
5	8 51 16.06	2.4218	16 8 34.2	6.622
6	8 53 41.38	2.4221	16 1 53.6	6.732
7	8 56 6.71	2.4223	15 55 6.3	6.842
8	8 58 32.05	2.4225	15 48 12.5	6.952
9	9 0 57.41	2.4227	15 41 12.1	7.061
10	9 3 22.78	2.4228	15 34 5.2	7.169
11	9 5 48.15	2.4229	15 26 51.8	7.277
12	9 8 13.53	2.4230	15 19 31.9	7.385
13	9 10 38.91	2.4230	15 12 5.6	7.492
14	9 13 4.29	2.4231	15 4 32.9	7.597
15	9 15 29.68	2.4232	14 56 53.9	7.702
16	9 17 55.07	2.4231	14 49 8.6	7.807
17	9 20 20.45	2.4229	14 41 17.0	7.912
18	9 22 45.82	2.4228	14 33 19.1	8.016
19	9 25 11.18	2.4227	14 25 15.1	8.118
20	9 27 36.54	2.4226	14 17 5.0	8.220
21	9 30 1.89	2.4224	14 8 48.7	8.322
22	9 32 27.23	2.4222	14 0 26.4	8.421
23	9 34 52.56	2.4220	N.13 51 58.2	8.520

MONDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 37 17.87	2.4217	N.13 43 24.0	8.619
1	9 39 43.17	2.4215	13 34 43.9	8.717
2	9 42 8.45	2.4212	13 25 57.9	8.815
3	9 44 33.71	2.4209	13 17 6.1	8.911
4	9 46 58.96	2.4206	13 8 8.6	9.006
5	9 49 24.18	2.4202	12 59 5.4	9.100
6	9 51 49.38	2.4198	12 49 56.6	9.193
7	9 54 14.56	2.4195	12 40 42.2	9.286
8	9 56 39.72	2.4191	12 31 22.2	9.378
9	9 59 4.85	2.4187	12 21 56.8	9.468
10	10 1 29.96	2.4182	12 12 26.0	9.558
11	10 3 55.04	2.4177	12 2 49.8	9.647
12	10 6 20.09	2.4172	11 53 8.3	9.735
13	10 8 45.11	2.4168	11 43 21.6	9.822
14	10 11 10.11	2.4164	11 33 29.7	9.906
15	10 13 35.08	2.4159	11 23 32.7	9.992
16	10 16 0.02	2.4154	11 13 30.7	10.074
17	10 18 24.93	2.4150	11 3 23.8	10.156
18	10 20 49.82	2.4145	10 53 12.0	10.237
19	10 23 14.67	2.4139	10 42 55.3	10.318
20	10 25 39.49	2.4134	10 32 33.8	10.397
21	10 28 4.28	2.4129	10 22 7.7	10.474
22	10 30 29.04	2.4123	10 11 36.9	10.551
23	10 32 53.76	2.4117	10 1 1.5	10.627
24	10 35 18.45	2.4112	N. 9 50 21.7	10.700

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 5.					THURSDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 35 18.45	2.4112	N. 9 50 21.7	10.700	0	12 30 30.76	2.3932	N. 0 17 22.4	12.601
1	10 37 43.11	2.4107	9 39 37.5	10.773	1	12 32 54.35	2.3931	N. 0 4 46.3	12.602
2	10 40 7.74	2.4102	9 28 48.9	10.845	2	12 35 17.93	2.3930	S. 0 7 49.9	12.602
3	10 42 32.33	2.4096	9 17 56.1	10.915	3	12 37 41.51	2.3930	0 20 26.0	12.601
4	10 44 56.89	2.4091	9 6 59.1	10.984	4	12 40 5.09	2.3930	0 33 2.0	12.598
5	10 47 21.42	2.4085	8 55 58.0	11.052	5	12 42 28.67	2.3930	0 45 37.7	12.593
6	10 49 45.91	2.4079	8 44 52.8	11.119	6	12 44 52.25	2.3931	0 58 13.1	12.587
7	10 52 10.37	2.4074	8 33 43.7	11.184	7	12 47 15.84	2.3932	1 10 48.1	12.578
8	10 54 34.80	2.4069	8 22 30.7	11.248	8	12 49 39.43	2.3932	1 23 22.5	12.568
9	10 56 59.20	2.4064	8 11 13.9	11.311	9	12 52 3.02	2.3933	1 35 56.3	12.557
10	10 59 23.57	2.4058	7 59 53.4	11.372	10	12 54 26.62	2.3934	1 48 29.4	12.544
11	11 1 47.90	2.4052	7 48 29.3	11.432	11	12 56 50.23	2.3935	2 1 1.6	12.529
12	11 4 12.20	2.4047	7 37 1.6	11.491	12	12 59 13.84	2.3936	2 13 32.9	12.513
13	11 6 36.47	2.4042	7 25 30.4	11.547	13	13 1 37.46	2.3937	2 26 3.2	12.496
14	11 9 0.71	2.4037	7 13 55.9	11.602	14	13 4 1.09	2.3939	2 38 32.4	12.476
15	11 11 24.92	2.4032	7 2 18.1	11.657	15	13 6 24.73	2.3941	2 51 0.3	12.454
16	11 13 49.10	2.4027	6 50 37.0	11.711	16	13 8 48.38	2.3943	3 3 26.9	12.432
17	11 16 13.25	2.4022	6 38 52.8	11.762	17	13 11 12.04	2.3945	3 15 52.2	12.409
18	11 18 37.36	2.4017	6 27 5.6	11.812	18	13 13 35.72	2.3947	3 28 16.0	12.383
19	11 21 1.45	2.4012	6 15 15.4	11.860	19	13 15 59.41	2.3949	3 40 38.1	12.355
20	11 23 25.51	2.4007	6 3 22.4	11.907	20	13 18 23.11	2.3952	3 52 58.6	12.327
21	11 25 49.54	2.4003	5 51 26.6	11.952	21	13 20 46.83	2.3954	4 5 17.3	12.296
22	11 28 13.55	2.3999	5 39 28.1	11.997	22	13 23 10.56	2.3957	4 17 34.1	12.264
23	11 30 37.53	2.3994	N. 5 27 27.0	12.040	23	13 25 34.31	2.3959	S. 4 29 49.0	12.231
	WEDNESDAY 6.					FRIDAY 8.			
0	11 33 1.48	2.3990	N. 5 15 23.3	12.082	0	13 27 58.07	2.3962	S. 4 42 1.8	12.195
1	11 35 25.41	2.3986	5 3 17.2	12.121	1	13 30 21.85	2.3965	4 54 12.4	12.158
2	11 37 49.32	2.3982	4 51 8.8	12.159	2	13 32 45.65	2.3968	5 6 20.8	12.121
3	11 40 13.20	2.3978	4 38 58.1	12.196	3	13 35 9.47	2.3972	5 18 26.9	12.081
4	11 42 37.06	2.3975	4 26 45.3	12.230	4	13 37 33.31	2.3975	5 30 30.5	12.039
5	11 45 0.90	2.3971	4 14 30.5	12.263	5	13 39 57.17	2.3978	5 42 31.6	11.996
6	11 47 24.71	2.3967	4 2 13.7	12.296	6	13 42 21.05	2.3982	5 54 30.0	11.951
7	11 49 48.50	2.3964	3 49 55.0	12.327	7	13 44 44.95	2.3985	6 6 25.7	11.906
8	11 52 12.27	2.3961	3 37 34.5	12.355	8	13 47 8.87	2.3988	6 18 18.7	11.859
9	11 54 36.03	2.3958	3 25 12.4	12.382	9	13 49 32.81	2.3992	6 30 8.8	11.810
10	11 56 59.77	2.3955	3 12 48.7	12.408	10	13 51 56.77	2.3996	6 41 55.9	11.760
11	11 59 23.49	2.3952	3 0 23.4	12.433	11	13 54 20.76	2.4000	6 53 40.0	11.708
12	12 1 47.20	2.3950	2 47 56.7	12.456	12	13 56 44.77	2.4003	7 5 20.9	11.655
13	12 4 10.89	2.3947	2 35 28.7	12.477	13	13 59 8.80	2.4007	7 16 58.6	11.601
14	12 6 34.57	2.3945	2 22 59.5	12.496	14	14 1 32.86	2.4011	7 28 33.0	11.545
15	12 8 58.23	2.3943	2 10 29.2	12.513	15	14 3 56.94	2.4015	7 40 4.0	11.487
16	12 11 21.88	2.3941	1 57 57.9	12.529	16	14 6 21.04	2.4018	7 51 31.5	11.428
17	12 13 45.52	2.3939	1 45 25.7	12.543	17	14 8 45.16	2.4022	8 2 55.4	11.368
18	12 16 9.15	2.3937	1 32 52.7	12.557	18	14 11 9.31	2.4026	8 14 15.7	11.307
19	12 18 32.77	2.3936	1 20 18.9	12.568	19	14 13 33.48	2.4030	8 25 32.2	11.244
20	12 20 56.38	2.3934	1 7 44.5	12.578	20	14 15 57.67	2.4034	8 36 45.0	11.181
21	12 23 19.98	2.3933	0 55 9.5	12.587	21	14 18 21.89	2.4038	8 47 53.9	11.115
22	12 25 43.58	2.3932	0 42 34.1	12.593	22	14 20 46.13	2.4042	8 58 58.8	11.048
23	12 28 7.17	2.3932	0 29 58.4	12.598	23	14 23 10.39	2.4046	9 9 59.7	10.980
24	12 30 30.76	2.3932	N. 0 17 22.4	12.601	24	14 25 34.68	2.4050	S. 9 20 56.4	10.910

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 9.					MONDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	14 25 34.68	2.4050	S. 9 20 56.4	10.910	0	16 21 11.24	2.4030	S. 16 24 14.0	6.396
1	14 27 58.99	2.4053	9 31 48.9	10.840	1	16 23 35.40	2.4022	16 30 34.4	6.284
2	14 30 23.32	2.4057	9 42 37.2	10.768	2	16 25 59.51	2.4015	16 36 48.1	6.172
3	14 32 47.67	2.4060	9 53 21.1	10.695	3	16 28 23.58	2.4007	16 42 55.1	6.061
4	14 35 12.04	2.4064	10 4 0.6	10.621	4	16 30 47.59	2.3998	16 48 55.4	5.949
5	14 37 36.44	2.4068	10 14 35.6	10.545	5	16 33 11.55	2.3988	16 54 49.0	5.837
6	14 40 0.86	2.4072	10 25 6.0	10.468	6	16 35 35.45	2.3978	17 0 35.8	5.724
7	14 42 25.30	2.4075	10 35 31.7	10.390	7	16 37 59.29	2.3968	17 6 15.8	5.610
8	14 44 49.76	2.4077	10 45 52.8	10.312	8	16 40 23.07	2.3958	17 11 49.0	5.496
9	14 47 14.23	2.4080	10 56 9.1	10.231	9	16 42 46.79	2.3947	17 17 15.3	5.382
10	14 49 38.72	2.4083	11 6 20.5	10.149	10	16 45 10.44	2.3936	17 22 34.8	5.268
11	14 52 3.23	2.4086	11 16 27.0	10.067	11	16 47 34.02	2.3924	17 27 47.5	5.154
12	14 54 27.76	2.4089	11 26 28.6	9.984	12	16 49 57.52	2.3911	17 32 53.3	5 039
13	14 56 52.30	2.4092	11 36 25.1	9.899	13	16 52 20.95	2.3898	17 37 52.2	4.924
14	14 59 16.86	2.4094	11 46 16.5	9.813	14	16 54 44.30	2.3886	17 42 44.2	4.810
15	15 1 41.43	2.4096	11 56 2.7	9.727	15	16 57 7.58	2.3872	17 47 29.4	4.695
16	15 4 6.01	2.4098	12 5 43.7	9.639	16	16 59 30.77	2.3858	17 52 7.6	4.579
17	15 6 30.61	2.4101	12 15 19.4	9.550	17	17 1 53.88	2.3844	17 56 38.9	4.464
18	15 8 55.22	2.4102	12 24 49.7	9.460	18	17 4 16.90	2.3829	18 1 3.3	4.349
19	15 11 19.84	2.4104	12 34 14.6	9.369	19	17 6 39.83	2.3813	18 5 20.8	4.233
20	15 13 44.47	2.4105	12 43 34.0	9.277	20	17 9 2.66	2.3798	18 9 31.3	4.117
21	15 16 9.10	2.4106	12 52 47.9	9.185	21	17 11 25.40	2.3782	18 13 34.9	4.002
22	15 18 33.74	2.4107	13 1 56.2	9.092	22	17 13 48.04	2.3765	18 17 31.6	3.887
23	15 20 58.38	2.4107	S. 13 10 58.9	8.997	23	17 16 10.58	2.3747	S. 18 21 21.3	3.771
	SUNDAY 10.					TUESDAY 12			
0	15 23 23.03	2.4108	S. 13 19 55.8	8.901	0	17 18 33.01	2.3730	S. 18 25 4.1	3.656
1	15 25 47.68	2.4108	13 28 47.0	8.805	1	17 20 55.34	2.3712	18 28 40.0	3.540
2	15 28 12.33	2.4108	13 37 32.4	8.708	2	17 23 17.56	2.3693	18 32 8.9	3.424
3	15 30 36.98	2.4107	13 46 11.9	8.610	3	17 25 39.66	2.3674	18 35 30.9	3.309
4	15 33 1.62	2.4107	13 54 45.6	8.512	4	17 28 1.65	2.3655	18 38 46.0	3.193
5	15 35 26.26	2.4107	14 3 13.3	8.412	5	17 30 23.52	2.3635	18 41 54.1	3.077
6	15 37 50.90	2.4106	14 11 35.0	8.312	6	17 32 45.27	2.3615	18 44 55.3	2.962
7	15 40 15.53	2.4104	14 19 50.7	8.211	7	17 35 6.90	2.3594	18 47 49.6	2.847
8	15 42 40.15	2.4103	14 28 0.3	8.109	8	17 37 28.40	2.3573	18 50 37.0	2.732
9	15 45 4.76	2.4101	14 36 3.7	8.006	9	17 39 49.78	2.3552	18 53 17.5	2.617
10	15 47 29.36	2.4098	14 44 1.0	7.903	10	17 42 11.03	2.3530	18 55 51.1	2.502
11	15 49 53.94	2.4095	14 51 52.1	7.799	11	17 44 32.14	2.3507	18 58 17.8	2.388
12	15 52 18.50	2.4093	14 59 36.9	7.694	12	17 46 53.12	2.3485	19 0 37.7	2.274
13	15 54 43.05	2.4090	15 7 15.4	7.589	13	17 49 13.96	2.3462	19 2 50.7	2.160
14	15 57 7.58	2.4086	15 14 47.6	7.484	14	17 51 34.66	2.3438	19 4 56.9	2.046
15	15 59 32.08	2.4082	15 22 13.5	7.377	15	17 53 55.21	2.3413	19 6 56.3	1.932
16	16 1 56.56	2.4077	15 29 32.9	7.270	16	17 56 15.62	2.3389	19 8 48.8	1.818
17	16 4 21.01	2.4072	15 36 45.9	7.162	17	17 58 35.88	2.3364	19 10 34.5	1.705
18	16 6 45.43	2.4067	15 43 52.4	7.054	18	18 0 55.99	2.3339	19 12 13.4	1.592
19	16 9 9.82	2.4062	15 50 52.4	6.946	19	18 3 15.95	2.3313	19 13 45.5	1.479
20	16 11 34.18	2.4057	15 57 45.9	6.837	20	18 5 35.75	2.3287	19 15 10.9	1.367
21	16 13 58.51	2.4051	16 4 32.8	6.727	21	18 7 55.39	2.3260	19 16 29.6	1.255
22	16 16 22.80	2.4044	16 11 13.2	6.617	22	18 10 14.87	2.3233	19 17 41.5	1.143
23	16 18 47.04	2.4037	16 17 46.9	6.507	23	18 12 34.19	2.3206	19 18 46.8	1.032
24	16 21 11.24	2.4030	S. 16 24 14.0	6.396	24	18 14 53.35	2.3179	S. 19 19 45.4	0.921

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 13.					**FRIDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 14 53.35	2.3179	S. 19 19 45.4	0.921	0	20 2 24.20	2.1542	S. 18 4 26.3	3.853
1	18 17 12.34	2.3151	19 20 37.3	0.810	1	20 4 33.34	2.1505	18 0 32.5	3.939
2	18 19 31.16	2.3122	19 21 22.6	0.699	2	20 6 42.26	2.1467	17 56 33.6	4.024
3	18 21 49.81	2.3093	19 22 1.2	0.588	3	20 8 50.95	2.1430	17 52 29.6	4.108
4	18 24 8.28	2.3064	19 22 33.2	0.479	4	20 10 59.42	2.1393	17 48 20.6	4.192
5	18 26 26.58	2.3035	19 22 58.7	0.371	5	20 13 7.67	2.1356	17 44 6.6	4.275
6	18 28 44.70	2.3005	19 23 17.7	0.262	6	20 15 15.69	2.1318	17 39 47.6	4.357
7	18 31 2.64	2.2975	19 23 30.1	0.153	7	20 17 23.49	2.1281	17 35 23.7	4.438
8	18 33 20.40	2.2944	19 23 36.0	−0.045	8	20 19 31.06	2.1243	17 30 55.0	4.519
9	18 35 37.97	2.2913	19 23 35.5	+0.062	9	20 21 38.41	2.1206	17 26 21.4	4.600
10	18 37 55.36	2.2882	19 23 28.5	0.170	10	20 23 45.53	2.1169	17 21 43.0	4.680
11	18 40 12.56	2.2851	19 23 15.1	0.277	11	20 25 52.44	2.1133	17 16 59.8	4.759
12	18 42 29.57	2.2819	19 22 55.3	0.383	12	20 27 59.13	2.1096	17 12 11.9	4.837
13	18 44 46.39	2.2787	19 22 29.1	0.489	13	20 30 5.60	2.1059	17 7 19.3	4.915
14	18 47 3.02	2.2755	19 21 56.6	0.594	14	20 32 11.84	2.1022	17 2 22.1	4.992
15	18 49 19.45	2.2722	19 21 17.8	0.699	15	20 34 17.86	2.0985	16 57 20.3	5.068
16	18 51 35.68	2.2689	19 20 32.7	0.803	16	20 36 23.66	2.0949	16 52 13.9	5.144
17	18 53 51.72	2.2656	19 19 41.4	0.907	17	20 38 29.25	2.0913	16 47 3.0	5.220
18	18 56 7.56	2.2623	19 18 43.8	1.011	18	20 40 34.62	2.0877	16 41 47.5	5.295
19	18 58 23.20	2.2590	19 17 40.0	1.114	19	20 42 39.77	2.0840	16 36 27.6	5.369
20	19 0 38.64	2.2556	19 16 30.1	1.217	20	20 44 44.70	2.0804	16 31 3.3	5.442
21	19 2 53.87	2.2521	19 15 14.0	1.319	21	20 46 49.42	2.0768	16 25 34.6	5.515
22	19 5 8.89	2.2487	19 13 51.8	1.420	22	20 48 53.92	2.0732	16 20 1.5	5.587
23	19 7 23.71	2.2453	S. 19 12 23.6	1.520	23	20 50 58.21	2.0697	S. 16 14 24.2	5.658
	THURSDAY 14.					**SATURDAY 16.**			
0	19 9 38.33	2.2419	S. 19 10 49.4	1.620	0	20 53 2.28	2.0661	S. 16 8 42.6	5.728
1	19 11 52.74	2.2384	19 9 9.2	1.720	1	20 55 6.14	2.0626	16 2 56.8	5.798
2	19 14 6.93	2.2348	19 7 23.0	1.820	2	20 57 9.79	2.0591	15 57 6.8	5.868
3	19 16 20.91	2.2313	19 5 30.8	1.919	3	20 59 13.23	2.0556	15 51 12.6	5.937
4	19 18 34.68	2.2278	19 3 32.7	2.017	4	21 1 16.46	2.0522	15 45 14.3	6.006
5	19 20 48.24	2.2242	19 1 28.8	2.114	5	21 3 19.49	2.0487	15 39 11.9	6.073
6	19 23 1.58	2.2205	18 59 19.1	2.210	6	21 5 22.31	2.0452	15 33 5.5	6.140
7	19 25 14.70	2.2169	18 57 3.6	2.307	7	21 7 24.92	2.0418	15 26 55.1	6.207
8	19 27 27.61	2.2133	18 54 42.3	2.403	8	21 9 27.33	2.0384	15 20 40.7	6.272
9	19 29 40.30	2.2097	18 52 15.2	2.499	9	21 11 29.53	2.0350	15 14 22.4	6.337
10	19 31 52.77	2.2061	18 49 42.4	2.593	10	21 13 31.53	2.0317	15 8 0.2	6.402
11	19 34 5.03	2.2025	18 47 4.0	2.687	11	21 15 33.34	2.0284	15 1 34.2	6.465
12	19 36 17.07	2.1988	18 44 20.0	2.780	12	21 17 34.94	2.0250	14 55 4.4	6.528
13	19 38 28.89	2.1952	18 41 30.4	2.872	13	21 19 36.34	2.0217	14 48 30.8	6.591
14	19 40 40.49	2.1915	18 38 35.3	2.965	14	21 21 37.55	2.0185	14 41 53.5	6.653
15	19 42 51.86	2.1877	18 35 34.6	3.057	15	21 23 38.56	2.0153	14 35 12.4	6.715
16	19 45 3.01	2.1840	18 32 28.4	3.148	16	21 25 39.38	2.0121	14 28 27.7	6.775
17	19 47 13.94	2.1803	18 29 16.8	3.238	17	21 27 40.01	2.0089	14 21 39.4	6.835
18	19 49 24.65	2.1766	18 25 59.8	3.328	18	21 29 40.45	2.0057	14 14 47.5	6.894
19	19 51 35.13	2.1728	18 22 37.4	3.417	19	21 31 40.70	2.0026	14 7 52.1	6.952
20	19 53 45.39	2.1691	18 19 9.7	3.506	20	21 33 40.76	1.9995	14 0 53.2	7.011
21	19 55 55.43	2.1654	18 15 36.7	3.594	21	21 35 40.64	1.9964	13 53 50.8	7.069
22	19 58 5.24	2.1617	18 11 58.4	3.682	22	21 37 40.33	1.9933	13 46 44.9	7.127
23	20 0 14.83	2.1580	18 8 14.9	3.768	23	21 39 39.84	1.9903	13 39 35.6	7.183
24	20 2 24.20	2.1542	S. 18 4 26.3	3.853	24	21 41 39.17	1.9873	S. 13 32 22.9	7.239

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 41 39.17	1.9873	S. 13 32 22.9	7.239
1	21 43 38.32	1.9843	13 25 6.9	7.293
2	21 45 37.29	1.9814	13 17 47.7	7.347
3	21 47 36.09	1.9786	13 10 25.2	7.402
4	21 49 34.72	1.9757	13 2 59.4	7.456
5	21 51 33.17	1.9728	12 55 30.5	7.509
6	21 53 31.45	1.9699	12 47 58.4	7.561
7	21 55 29.56	1.9671	12 40 23.2	7.612
8	21 57 27.51	1.9644	12 32 44.9	7.663
9	21 59 25.29	1.9617	12 25 3.6	7.713
10	22 1 22.91	1.9590	12 17 19.3	7.763
11	22 3 20.37	1.9563	12 9 32.0	7.812
12	22 5 17.67	1.9537	12 1 41.8	7.861
13	22 7 14.82	1.9511	11 53 48.7	7.909
14	22 9 11.81	1.9485	11 45 52.7	7.957
15	22 11 8.64	1.9459	11 37 53.9	8.003
16	22 13 5.32	1.9435	11 29 52.3	8.049
17	22 15 1.86	1.9411	11 21 48.0	8.095
18	22 16 58.25	1.9386	11 13 40.9	8.141
19	22 18 54.50	1.9362	11 5 31.1	8.185
20	22 20 50.60	1.9339	10 57 18.7	8.228
21	22 22 46.56	1.9316	10 49 3.7	8.271
22	22 24 42.39	1.9293	10 40 46.1	8.314
23	22 26 38.08	1.9270	S. 10 32 26.0	8.357

MONDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 28 33.63	1.9247	S. 10 24 3.3	8.398
1	22 30 29.05	1.9226	10 15 38.2	8.439
2	22 32 24.34	1.9205	10 7 10.6	8.480
3	22 34 19.51	1.9184	9 58 40.6	8.520
4	22 36 14.55	1.9163	9 50 8.2	8.559
5	22 38 9.47	1.9143	9 41 33.5	8.598
6	22 40 4.27	1.9123	9 32 56.5	8.636
7	22 41 58.95	1.9104	9 24 17.2	8.673
8	22 43 53.52	1.9085	9 15 35.7	8.710
9	22 45 47.97	1.9066	9 6 52.0	8.746
10	22 47 42.31	1.9047	8 58 6.2	8.782
11	22 49 36.54	1.9029	8 49 18.2	8.817
12	22 51 30.66	1.9012	8 40 28.1	8.852
13	22 53 24.68	1.8995	8 31 36.0	8.886
14	22 55 18.60	1.8978	8 22 41.8	8.920
15	22 57 12.41	1.8961	8 13 45.6	8.953
16	22 59 6.13	1.8945	8 4 47.5	8.985
17	23 0 59.75	1.8929	7 55 47.4	9.017
18	23 2 53.28	1.8914	7 46 45.4	9.048
19	23 4 46.72	1.8899	7 37 41.6	9.078
20	23 6 40.07	1.8884	7 28 36.0	9.108
21	23 8 33.33	1.8870	7 19 28.6	9.138
22	23 10 26.51	1.8857	7 10 19.4	9.168
23	23 12 19.61	1.8844	7 1 8.4	9.197
24	23 14 12.63	1.8831	S. 6 51 55.7	9.225

TUESDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 14 12.63	1.8831	S. 6 51 55.7	9.225
1	23 16 5.58	1.8818	6 42 41.4	9.252
2	23 17 58.45	1.8806	6 33 25.5	9.279
3	23 19 51.25	1.8794	6 24 8.0	9.305
4	23 21 43.98	1.8783	6 14 48.9	9.330
5	23 23 36.64	1.8772	6 5 28.4	9.354
6	23 25 29.24	1.8762	5 56 6.4	9.379
7	23 27 21.78	1.8752	5 46 42.9	9.403
8	23 29 14.26	1.8742	5 37 18.0	9.427
9	23 31 6.68	1.8732	5 27 51.7	9.450
10	23 32 59.05	1.8723	5 18 24.0	9.472
11	23 34 51.36	1.8714	5 8 55.0	9.493
12	23 36 43.62	1.8706	4 59 24.8	9.514
13	23 38 35.84	1.8699	4 49 53.3	9.535
14	23 40 28.01	1.8692	4 40 20.6	9.555
15	23 42 20.14	1.8685	4 30 46.7	9.575
16	23 44 12.23	1.8678	4 21 11.6	9.594
17	23 46 4.28	1.8672	4 11 35.4	9.612
18	23 47 56.30	1.8667	4 1 58.2	9.629
19	23 49 48.28	1.8662	3 52 20.0	9.645
20	23 51 40.24	1.8657	3 42 40.8	9.662
21	23 53 32.17	1.8653	3 33 0.6	9.678
22	23 55 24.08	1.8649	3 23 19.4	9.694
23	23 57 15.96	1.8645	S. 3 13 37.3	9.708

WEDNESDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 59 7.82	1.8642	S. 3 3 54.4	9.722
1	0 0 59.67	1.8640	2 54 10.6	9.736
2	0 2 51.50	1.8637	2 44 26.0	9.749
3	0 4 43.31	1.8634	2 34 40.7	9.762
4	0 6 35.11	1.8633	2 24 54.6	9.774
5	0 8 26.91	1.8632	2 15 7.8	9.785
6	0 10 18.70	1.8632	2 5 20.4	9.796
7	0 12 10.49	1.8632	1 55 32.3	9.807
8	0 14 2.28	1.8632	1 45 43.6	9.816
9	0 15 54.07	1.8633	1 35 54.4	9.825
10	0 17 45.87	1.8634	1 26 4.6	9.833
11	0 19 37.68	1.8635	1 16 14.4	9.841
12	0 21 29.49	1.8636	1 6 23.7	9.848
13	0 23 21.31	1.8638	0 56 32.6	9.855
14	0 25 13.15	1.8641	0 46 41.1	9.862
15	0 27 5.01	1.8645	0 36 49.2	9.867
16	0 28 56.89	1.8648	0 26 57.1	9.871
17	0 30 48.79	1.8652	0 17 4.7	9.876
18	0 32 40.71	1.8656	S. 0 7 12.0	9.880
19	0 34 32.66	1.8661	N. 0 2 40.9	9.883
20	0 36 24.64	1.8666	0 12 33.9	9.885
21	0 38 16.65	1.8672	0 22 27.1	9.887
22	0 40 8.70	1.8677	0 32 20.4	9.888
23	0 42 0.78	1.8683	0 42 13.7	9.888
24	0 43 52.90	1.8690	N. 0 52 7.0	9.888

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 21.					SATURDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 43 52.90	1.8690	N. 0 52 7.0	9.888	0	2 15 6.86	1.9466	N. 8 34 49.2	9.137
1	0 45 45.06	1.8697	1 2 0.3	9.888	1	2 17 3.73	1.9491	8 43 56.5	9.105
2	0 47 37.27	1.8705	1 11 53.6	9.887	2	2 19 0.75	1.9516	8 53 1.8	9.072
3	0 49 29.52	1.8713	1 21 46.8	9.885	3	2 20 57.92	1.9541	9 2 5.1	9.038
4	0 51 21.82	1.8722	1 31 39.8	9.882	4	2 22 55.24	1.9567	9 11 6.4	9.004
5	0 53 14.18	1.8731	1 41 32.7	9.880	5	2 24 52.72	1.9593	9 20 5.6	8.969
6	0 55 6.59	1.8740	1 51 25.4	9.877	6	2 26 50.36	1.9619	9 29 2.7	8.933
7	0 56 59.06	1.8749	2 1 17.9	9.873	7	2 28 48.15	1.9646	9 37 57.6	8.897
8	0 58 51.58	1.8758	2 11 10.1	9.868	8	2 30 46.11	1.9673	9 46 50.3	8.859
9	1 0 44.16	1.8769	2 21 2.0	9.862	9	2 32 44.23	1.9700	9 55 40.7	8.821
10	1 2 36.81	1.8780	2 30 53.5	9.855	10	2 34 42.51	1.9727	10 4 28.8	8.782
11	1 4 29.52	1.8791	2 40 44.6	9.848	11	2 36 40.96	1.9755	10 13 14.6	8.743
12	1 6 22.30	1.8802	2 50 35.3	9.841	12	2 38 39.58	1.9783	10 21 58.0	8.703
13	1 8 15.15	1.8814	3 0 25.6	9.834	13	2 40 38.36	1.9812	10 30 39.0	8.662
14	1 10 8.07	1.8827	3 10 15.4	9.825	14	2 42 37.32	1.9841	10 39 17.5	8.620
15	1 12 1.07	1.8840	3 20 4.6	9.815	15	2 44 36.45	1.9869	10 47 53.4	8.577
16	1 13 54.15	1.8853	3 29 53.2	9.805	16	2 46 35.75	1.9898	10 56 26.8	8.534
17	1 15 47.31	1.8866	3 39 41.2	9.796	17	2 48 35.23	1.9927	11 4 57.5	8.490
18	1 17 40.54	1.8879	3 49 28.6	9.784	18	2 50 34.88	1.9957	11 13 25.6	8.446
19	1 19 33.85	1.8893	3 59 15.3	9.772	19	2 52 34.71	1.9987	11 21 51.0	8.401
20	1 21 27.26	1.8909	4 9 1.2	9.759	20	2 54 34.72	2.0017	11 30 13.7	8.355
21	1 23 20.76	1.8924	4 18 46.4	9.746	21	2 56 34.91	2.0047	11 38 33.6	8.307
22	1 25 14.35	1.8939	4 28 30.8	9.732	22	2 58 35.29	2.0078	11 46 50.6	8.259
23	1 27 8.03	1.8955	N. 4 38 14.3	9.717	23	3 0 35.85	2.0108	N.11 55 4.7	8.211
	FRIDAY 22.					SUNDAY 24.			
0	1 29 1.81	1.8971	N. 4 47 56.9	9.702	0	3 2 36.59	2.0139	N.12 3 16.0	8.163
1	1 30 55.68	1.8988	4 57 38.6	9.687	1	3 4 37.52	2.0171	12 11 24.3	8.113
2	1 32 49.66	1.9005	5 7 19.3	9.671	2	3 6 38.64	2.0202	12 19 29.5	8.062
3	1 34 43.74	1.9022	5 16 59.1	9.654	3	3 8 39.95	2.0233	12 27 31.7	8.011
4	1 36 37.92	1.9039	5 26 37.8	9.636	4	3 10 41.44	2.0265	12 35 30.8	7.959
5	1 38 32.21	1.9057	5 36 15.4	9.617	5	3 12 43.13	2.0297	12 43 26.7	7.906
6	1 40 26.61	1.9076	5 45 51.8	9.598	6	3 14 45.01	2.0329	12 51 19.5	7.852
7	1 42 21.12	1.9095	5 55 27.1	9.578	7	3 16 47.08	2.0362	12 59 9.0	7.797
8	1 44 15.75	1.9114	6 5 1.2	9.558	8	3 18 49.35	2 0395	13 6 55.2	7.742
9	1 46 10.49	1.9133	6 14 34.0	9.537	9	3 20 51.82	2.0428	13 14 38.1	7.687
10	1 48 5.35	1.9153	6 24 5.6	9.515	10	3 22 54.48	2.0461	13 22 17.6	7.630
11	1 50 0.33	1.9173	6 33 35.8	9.493	11	3 24 57.34	2.0494	13 29 53.7	7.573
12	1 51 55.42	1.9193	6 43 4.7	9.470	12	3 27 0.40	2.0527	13 37 26.4	7.516
13	1 53 50.64	1.9214	6 52 32.2	9.446	13	3 29 3.66	2.0560	13 44 55.6	7.457
14	1 55 45.99	1.9236	7 1 58.2	9.421	14	3 31 7.12	2.0593	13 52 21.2	7.396
15	1 57 41.47	1.9257	7 11 22.7	9.395	15	3 33 10.77	2.0626	13 59 43.1	7.335
16	1 59 37.08	1.9279	7 20 45.6	9.369	16	3 35 14.63	2.0660	14 7 1.4	7.274
17	2 1 32.82	1.9301	7 30 7.0	9.343	17	3 37 18.69	2.0694	14 14 16.0	7.212
18	2 3 28.69	1.9324	7 39 26.8	9.316	18	3 39 22.96	2.0728	14 21 26.9	7.150
19	2 5 24.70	1.9347	7 48 44.9	9.288	19	3 41 27.43	2.0762	14 28 34.0	7.087
20	2 7 20.85	1.9370	7 58 1.3	9.259	20	3 43 32.10	2.0796	14 35 37.3	7.022
21	2 9 17.14	1.9393	8 7 16.0	9.230	21	3 45 36.98	2.0830	14 42 36.7	6.957
22	2 11 13.57	1.9417	8 16 28.9	9.200	22	3 47 42.06	2.0864	14 49 32.2	6.892
23	2 13 10.14	1.9441	8 25 40.0	9.169	23	3 49 47.35	2.0898	14 56 23.7	6.826
24	2 15 6.86	1.9466	N. 8 34 49.2	9.137	24	3 51 52.84	2.0932	N.15 3 11.3	6.759

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 25.					WEDNESDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 51 52.84	2.0932	N.15 3 11.3	6.759	0	5 36 16.76	2.2519	N.18 56 31.0	2.705
1	3 53 58.54	2.0967	15 9 54.8	6.691	1	5 38 31.96	2.2547	18 59 10.3	2.605
2	3 56 4.45	2.1002	15 16 34.2	6.622	2	5 40 47.33	2.2576	19 1 43.6	2.504
3	3 58 10.57	2.1037	15 23 9.4	6.552	3	5 43 2.87	2.2604	19 4 10.8	2.403
4	4 0 16.89	2.1071	15 29 40.5	6.482	4	5 45 18.58	2.2632	19 6 32.0	2.302
5	4 2 23.42	2.1106	15 36 7.3	6.411	5	5 47 34.46	2.2660	19 8 47.1	2.200
6	4 4 30.16	2.1141	15 42 29.8	6.339	6	5 49 50.50	2.2687	19 10 56.0	2.098
7	4 6 37.11	2.1176	15 48 48.0	6.267	7	5 52 6.70	2.2713	19 12 58.8	1.995
8	4 8 44.27	2.1211	15 55 1.8	6.194	8	5 54 23.05	2.2738	19 14 55.4	1.891
9	4 10 51.64	2.1245	16 1 11.3	6.121	9	5 56 39.56	2.2764	19 16 45.7	1.787
10	4 12 59.21	2.1279	16 7 16.3	6.046	10	5 58 56.22	2.2790	19 18 29.8	1.683
11	4 15 6.99	2.1314	16 13 16.8	5.971	11	6 1 13.04	2.2816	19 20 7.7	1.579
12	4 17 14.98	2.1349	16 19 12.8	5.895	12	6 3 30.01	2.2840	19 21 39.3	1.474
13	4 19 23.18	2.1384	16 25 4.2	5.818	13	6 5 47.12	2.2864	19 23 4.5	1.368
14	4 21 31.59	2.1418	16 30 50.9	5.740	14	6 8 4.38	2.2888	19 24 23.4	1.262
15	4 23 40.20	2.1452	16 36 33.0	5.662	15	6 10 21.78	2.2912	19 25 35.9	1.155
16	4 25 49.02	2.1487	16 42 10.4	5.583	16	6 12 39.32	2.2935	19 26 42.0	1.049
17	4 27 58.05	2.1522	16 47 43.0	5.503	17	6 14 57.00	2.2958	19 27 41.7	0.942
18	4 30 7.29	2.1557	16 53 10.7	5.422	18	6 17 14.82	2.2981	19 28 35.0	0.834
19	4 32 16.73	2.1591	16 58 33.6	5.342	19	6 19 32.77	2.3003	19 29 21.8	0.726
20	4 34 26.38	2.1626	17 3 51.7	5.261	20	6 21 50.85	2.3024	19 30 2.1	0.617
21	4 36 36.24	2.1660	17 9 4.9	5.178	21	6 24 9.06	2.3045	19 30 35.9	0.509
22	4 38 46.30	2.1693	17 14 13.1	5.094	22	6 26 27.39	2.3065	19 31 3.2	0.400
23	4 40 56.56	2.1727	N.17 19 16.2	5.010	23	6 28 45.84	2.3085	N.19 31 23.9	0.290
	TUESDAY 26.					THURSDAY 28.			
0	4 43 7.03	2.1761	N.17 24 14.3	4.926	0	6 31 4.41	2.3105	N.19 31 38.0	0.181
1	4 45 17.70	2.1795	17 29 7.3	4.841	1	6 33 23.10	2.3125	19 31 45.6	+0.071
2	4 47 28.57	2.1829	17 33 55.2	4.755	2	6 35 41.91	2.3144	19 31 46.6	−0.039
3	4 49 39.65	2.1863	17 38 37.9	4.668	3	6 38 0.83	2.3162	19 31 40.9	0.150
4	4 51 50.93	2.1896	17 43 15.4	4.581	4	6 40 19.86	2.3181	19 31 28.6	0.260
5	4 54 2.40	2.1928	17 47 47.6	4.493	5	6 42 39.00	2.3199	19 31 9.7	0.371
6	4 56 14.07	2.1962	17 52 14.5	4.404	6	6 44 58.25	2.3217	19 30 44.1	0.482
7	4 58 25.94	2.1995	17 56 36.1	4.315	7	6 47 17.60	2.3233	19 30 11.8	0.594
8	5 0 38.01	2.2027	18 0 52.3	4.226	8	6 49 37.05	2.3249	19 29 32.8	0.705
9	5 2 50.27	2.2059	18 5 3.2	4.136	9	6 51 56.59	2.3265	19 28 47.2	0.816
10	5 5 2.72	2.2092	18 9 8.6	4.044	10	6 54 16.23	2.3281	19 27 54.9	0.928
11	5 7 15.37	2.2124	18 13 8.5	3.952	11	6 56 35.96	2.3297	19 26 55.8	1.041
12	5 9 28.21	2.2156	18 17 2.8	3.859	12	6 58 55.79	2.3312	19 25 49.9	1.154
13	5 11 41.24	2.2187	18 20 51.6	3.766	13	7 1 15.70	2.3325	19 24 37.3	1.266
14	5 13 54.46	2.2219	18 24 34.8	3.673	14	7 3 35.69	2.3339	19 23 18.0	1.378
15	5 16 7.87	2.2251	18 28 12.4	3.579	15	7 5 55.77	2.3352	19 21 51 9	1.491
16	5 18 21.47	2.2282	18 31 44.3	3.484	16	7 8 15.92	2.3365	19 20 19.1	1.604
17	5 20 35.25	2.2312	18 35 10.5	3.388	17	7 10 36.15	2.3377	19 18 39.5	1.717
18	5 22 49.21	2.2343	18 38 30.9	3.292	18	7 12 56.45	2.3389	19 16 53.1	1.830
19	5 25 3.36	2.2373	18 41 45.6	3.196	19	7 15 16.82	2.3401	19 14 59.9	1.943
20	5 27 17.69	2.2402	18 44 54.4	3.099	20	7 17 37.26	2.3412	19 12 59.9	2.056
21	5 29 32.19	2.2432	18 47 57.4	3.001	21	7 19 57.77	2.3423	19 10 53.2	2.169
22	5 31 46.87	2.2462	18 50 54.5	2.902	22	7 22 18.34	2.3433	19 8 39.7	2.282
23	5 34 1.73	2.2491	18 53 45.7	2.804	23	7 24 38.97	2.3442	19 6 19.4	2.396
24	5 36 16.76	2.2519	N.18 56 31.0	2.705	24	7 26 59.65	2.3452	N.19 3 52.2	2.510

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	7 26 59.65	2.3452	N.19 3 52.2	2.510
1	7 29 20.39	2.3461	19 1 18.2	2.623
2	7 31 41.18	2.3470	18 58 37.5	2.735
3	7 34 2.03	2.3478	18 55 50.0	2.848
4	7 36 22.92	2.3485	18 52 55.7	2.961
5	7 38 43.85	2.3493	18 49 54.6	3.074
6	7 41 4.83	2.3500	18 46 46.8	3.187
7	7 43 25.85	2.3506	18 43 32.2	3.300
8	7 45 46.90	2.3512	18 40 10.8	3.413
9	7 48 7.99	2.3517	18 36 42.6	3.526
10	7 50 29.11	2.3522	18 33 7.6	3.639
11	7 52 50.26	2.3527	18 29 25.9	3.751
12	7 55 11.44	2.3531	18 25 37.5	3.863
13	7 57 32.64	2.3535	18 21 42.4	3.975
14	7 59 53.86	2.3539	18 17 40.5	4.087
15	8 2 15.11	2.3542	18 13 31.9	4.199
16	8 4 36.37	2.3545	18 9 16.6	4.311
17	8 6 57.65	2.3548	18 4 54.6	4.422
18	8 9 18.95	2.3551	18 0 26.0	4.532
19	8 11 40.26	2.3552	17 55 50.7	4.643
20	8 14 1.57	2.3553	17 51 8.8	4.754
21	8 16 22.89	2.3554	17 46 20.2	4.865
22	8 18 44.22	2.3555	17 41 25.0	4.975
23	8 21 5.55	2.3556	N.17 36 23.2	5.084

SATURDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	8 23 26.89	2.3556	N.17 31 14.9	5.193
1	8 25 48.22	2.3555	17 26 0.0	5.302
2	8 28 9.55	2.3554	17 20 38.6	5.411
3	8 30 30.87	2.3553	17 15 10.7	5.519
4	8 32 52.19	2.3552	17 9 36.3	5.627
5	8 35 13.50	2.3551	17 3 55.5	5.734
6	8 37 34.80	2.3549	16 58 8.2	5.841
7	8 39 56.09	2.3547	16 52 14.5	5.948
8	8 42 17.37	2.3545	16 46 14.4	6.054
9	8 44 38.63	2.3542	16 40 8.0	6.160
10	8 46 59.88	2.3540	16 33 55.2	6.266
11	8 49 21.11	2.3537	16 27 36.1	6.371
12	8 51 42.32	2.3533	16 21 10.7	6.475
13	8 54 3.51	2.3530	16 14 39.1	6.579
14	8 56 24.68	2.3526	16 8 1.3	6.683
15	8 58 45.82	2.3522	16 1 17.2	6.786
16	9 1 6.94	2.3518	15 54 27.0	6.888
17	9 3 28.04	2.3514	15 47 30.7	6.989
18	9 5 49.11	2.3509	15 40 28.3	7.091
19	9 8 10.15	2.3504	15 33 19.8	7.192
20	9 10 31.16	2.3500	15 26 5.3	7.291
21	9 12 52.15	2.3495	15 18 44.9	7.390
22	9 15 13.10	2.3489	15 11 18.5	7.489
23	9 17 34.02	2.3484	15 3 46.2	7.587
24	9 19 54.91	2.3479	N.14 56 8.0	7.685

SUNDAY, MAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 19 54.91	2.3479	N.14 56 8.0	7.685

PHASES OF THE MOON.

		d	h	m
☽ First Quarter	. April	1	1	52.8
○ Full Moon		7	17	39.0
☾ Last Quarter. . . .		14	16	3.8
● New Moon		22	20	53.2
☽ First Quarter . . .		30	11	0.3

		d	h
☾ Perigee	April	6	23.6
☾ Apogee		19	14.5

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
1	SUN	W.	89° 2′ 12″	2901	90° 34′ 30″	2884	92° 7′ 9″	2867	93° 40′ 10″	2849
	α Arietis	W.	65 35 25	2734	67 11 20	2714	68 47 41	2694	70 24 29	2675
	VENUS	W.	60 50 30	2997	62 20 47	2979	63 51 26	2961	65 22 28	2942
	Aldebaran	W.	32 12 41	2559	33 52 33	2543	35 32 46	2527	37 13 21	2511
	Regulus	E.	47 56 9	2559	46 16 17	2543	44 36 3	2527	42 55 27	2511
	Spica	E.	101 37 9	2585	99 57 54	2569	98 18 17	2553	96 38 18	2536
2	SUN	W.	101 30 54	2762	103 6 12	2744	104 41 53	2726	106 17 58	2709
	α Arietis	W.	78 34 58	2580	80 14 21	2562	81 54 8	2544	83 34 20	2526
	VENUS	W.	73 3 23	2852	74 36 44	2833	76 10 29	2815	77 44 38	2796
	Aldebaran	W.	45 42 0	2429	47 24 54	2412	49 8 12	2396	50 51 53	2379
	Regulus	E.	34 26 48	2429	32 43 55	2412	31 0 38	2396	29 16 57	2379
	Spica	E.	88 12 42	2455	86 30 25	2438	84 47 45	2422	83 4 42	2405
	JUPITER	E.	99 25 2	2401	97 41 28	2384	95 57 30	2368	94 13 9	2350
3	SUN	W.	114 24 15	2621	116 2 41	2604	117 41 30	2588	119 20 42	2571
	VENUS	W.	85 41 23	2705	87 17 56	2688	88 54 52	2671	90 32 11	2653
	Aldebaran	W.	59 36 18	2296	61 22 23	2280	63 8 52	2264	64 55 44	2248
	SATURN	W.	22 3 36	2356	23 48 14	2333	25 33 25	2312	27 19 7	2291
	Spica	E.	74 23 32	2324	72 38 8	2309	70 52 22	2294	69 6 13	2278
	JUPITER	E.	85 25 19	2268	83 38 33	2252	81 51 23	2237	80 3 50	2220
4	VENUS	W.	98 44 33	2571	100 24 8	2556	102 4 4	2541	103 44 20	2527
	Aldebaran	W.	73 55 55	2172	75 45 5	2158	77 34 36	2144	79 24 28	2130
	SATURN	W.	36 14 40	2202	38 3 4	2186	39 51 52	2172	41 41 2	2157
	Pollux	W.	31 12 31	2400	32 56 6	2364	34 40 32	2332	36 25 45	2303
	Spica	E.	60 10 0	2208	58 21 44	2194	56 33 8	2182	54 44 14	2170
	JUPITER	E.	71 0 16	2146	69 10 27	2132	67 20 16	2118	65 29 44	2105
	Antares	E.	105 59 29	2238	104 11 58	2223	102 24 4	2208	100 35 48	2194
5	Aldebaran	W.	88 38 45	2070	90 30 30	2059	92 22 32	2049	94 14 50	2039
	SATURN	W.	50 52 12	2092	52 43 24	2081	54 34 53	2070	56 26 38	2060
	Pollux	W.	45 21 23	2190	47 10 6	2172	48 59 16	2155	50 48 51	2140
	Spica	E.	45 35 37	2122	43 45 12	2116	41 54 37	2110	40 3 53	2105
	JUPITER	E.	56 12 15	2046	54 19 53	2036	52 27 15	2026	50 34 21	2017
	Antares	E.	91 29 24	2132	89 39 13	2120	87 48 45	2110	85 58 1	2101
6	SATURN	W.	65 48 53	2021	67 41 54	2016	69 35 4	2010	71 28 22	2006
	Pollux	W.	60 1 51	2083	61 53 17	2075	63 44 55	2067	65 36 45	2061
	Regulus	W.	23 31 14	2002	25 24 45	1996	27 18 25	1992	29 12 12	1988
	JUPITER	E.	41 6 49	1985	39 12 51	1981	37 18 46	1977	35 24 35	1974
	Antares	E.	76 41 16	2067	74 49 26	2062	72 57 29	2059	71 5 27	2057
7	SATURN	W.	80 56 6	1997	82 49 45	1998	84 43 23	1999	86 36 59	2001
	Pollux	W.	74 57 50	2044	76 50 15	2044	78 42 41	2044	80 35 7	2046
	Regulus	W.	38 42 19	1979	40 36 26	1979	42 30 33	1981	44 24 38	1983
	Antares	E.	61 44 49	2059	59 52 47	2063	58 0 51	2068	56 9 2	2073
8	SATURN	W.	96 3 43	2024	97 56 40	2031	99 49 26	2038	101 42 1	2046
	Pollux	W.	89 56 13	2066	91 48 4	2073	93 39 45	2081	95 31 14	2090
	Regulus	W.	53 53 47	2005	55 47 14	2012	57 40 30	2019	59 33 34	2026
	Antares	E.	46 52 57	2124	45 2 35	2139	43 12 36	2156	41 23 2	2174

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}.	P. L. of Diff.	XVIII^{h}.	P. L. of Diff.	XXI^{h}.	P. L. of Diff.
1	Sun	W.	95° 13′ 34″	2632	96° 47′ 20″	2615	98° 21′ 28″	2598	99° 55′ 59″	2579
	α Arietis	W.	72 1 43	2655	73 39 23	2636	75 17 29	2617	76 56 1	2599
	Venus	W.	66 53 53	2924	68 25 41	2906	69 57 52	2888	71 30 26	2870
	Aldebaran	W.	38 54 19	2495	40 35 39	2479	42 17 22	2462	43 59 29	2445
	Regulus	E.	41 14 29	2494	39 33 8	2479	37 51 25	2462	36 9 18	2445
	Spica	E.	94 57 57	2521	93 17 13	2504	91 36 6	2488	89 54 36	2471
2	Sun	W.	107 54 26	2691	109 31 18	2674	111 8 33	2656	112 46 12	2638
	α Arietis	W.	85 14 57	2509	86 55 58	2492	88 37 23	2475	90 19 11	2459
	Venus	W.	79 19 11	2778	80 54 8	2760	82 29 29	2741	84 5 14	2723
	Aldebaran	W.	52 35 58	2362	54 20 27	2346	56 5 20	2329	57 50 37	2313
	Regulus	E.	27 32 52	2362	25 48 23	2346	24 3 30	2330	22 18 14	2313
	Spica	E.	81 21 15	2389	79 37 24	2373	77 53 10	2357	76 8 33	2340
	Jupiter	E.	92 28 23	2334	90 43 13	2317	88 57 39	2301	87 11 41	2285
3	Sun	W.	121 0 17	2555	122 40 14	2538	124 20 34	2522	126 1 16	2507
	Venus	W.	92 9 54	2636	93 48 0	2619	95 26 29	2603	97 5 20	2587
	Aldebaran	W.	66 43 0	2233	68 30 39	2216	70 18 42	2202	72 7 7	2186
	Saturn	W.	29 5 19	2272	30 51 59	2253	32 39 7	2236	34 26 41	2219
	Spica	E.	67 19 41	2263	65 32 47	2249	63 45 32	2235	61 57 56	2221
	Jupiter	E.	78 15 53	2205	76 27 33	2190	74 38 50	2174	72 49 44	2160
4	Venus	W.	105 24 56	2513	107 5 51	2499	108 47 5	2487	110 28 37	2475
	Aldebaran	W.	81 14 41	2117	83 5 14	2105	84 56 6	2092	86 47 17	2081
	Saturn	W.	43 30 35	2142	45 20 30	2129	47 10 45	2116	49 1 19	2104
	Pollux	W.	38 11 40	2277	39 58 14	2251	41 45 25	2229	43 33 9	2209
	Spica	E.	52 55 2	2159	51 5 33	2149	49 15 49	2139	47 25 50	2130
	Jupiter	E.	63 38 52	2092	61 47 40	2079	59 56 9	2068	58 4 21	2057
	Antares	E.	98 47 11	2180	96 58 13	2167	95 8 55	2154	93 19 18	2143
5	Aldebaran	W.	96 7 23	2031	98 0 9	2023	99 53 8	2015	101 46 19	2008
	Saturn	W.	58 18 39	2051	60 10 54	2042	62 3 22	2035	63 56 2	2028
	Pollux	W.	52 38 49	2127	54 29 7	2115	56 19 44	2103	58 10 39	2092
	Spica	E.	38 13 2	2102	36 22 6	2101	34 31 8	2101	32 40 10	2103
	Jupiter	E.	48 41 13	2009	46 47 53	2002	44 54 22	1995	43 0 40	1989
	Antares	E.	84 7 3	2093	82 15 53	2085	80 24 31	2078	78 32 58	2072
6	Saturn	W.	73 21 47	2003	75 15 17	2000	77 8 51	1998	79 2 28	1998
	Pollux	W.	67 28 45	2055	69 20 53	2052	71 13 7	2048	73 5 27	2046
	Regulus	W.	31 6 5	1985	33 0 3	1982	34 54 6	1980	36 48 12	1979
	Jupiter	E.	33 30 20	1974	31 36 4	1974	29 41 49	1975	27 47 36	1978
	Antares	E.	69 13 21	2055	67 21 13	2055	65 29 4	2055	63 36 55	2057
7	Saturn	W.	88 30 32	2004	90 24 0	2008	92 17 22	2012	94 10 37	2018
	Pollux	W.	82 27 30	2048	84 19 50	2051	86 12 5	2055	88 4 13	2061
	Regulus	W.	46 18 39	1986	48 12 36	1989	50 6 27	1994	52 0 11	1999
	Antares	E.	51 17 22	2081	52 25 54	2090	50 34 39	2099	48 43 39	2111
8	Saturn	W.	103 34 23	2055	105 26 31	2066	107 18 23	2076	109 9 59	2088
	Pollux	W.	97 22 29	2099	99 13 30	2109	101 4 16	2120	102 54 45	2132
	Regulus	W.	61 26 25	2037	63 19 2	2046	65 11 25	2056	67 3 32	2067
	Antares	E.	39 33 56	2196	37 45 22	2219	35 57 23	2246	34 10 4	2276

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
9	Regulus	W.	68° 55′ 22″	2079	70° 46′ 54″	2090	72° 38′ 8″	2103	74° 29′ 2″	2116
	Spica	W.	16 22 19	2395	18 6 1	2350	19 50 48	2320	21 36 18	2301
	α Aquilæ	E.	81 34 32	2592	79 55 26	2610	78 16 44	2629	76 38 29	2651
10	Regulus	W.	83 38 12	2191	85 26 53	2207	87 15 10	2223	89 3 3	2241
	Spica	W.	30 27 44	2289	32 13 59	2296	34 0 5	2304	35 45 59	2314
	Jupiter	W.	19 49 43	2308	21 37 59	2316	23 26 3	2327	25 13 51	2339
	α Aquilæ	E.	68 35 15	2785	67 0 27	2818	65 26 22	2852	63 53 2	2889
	Fomalhaut	E.	101 28 25	2487	99 46 53	2499	98 5 39	2514	96 24 45	2528
11	Regulus	W.	97 55 59	2330	99 41 15	2348	101 26 4	2366	103 10 27	2385
	Spica	W.	44 31 10	2381	46 15 12	2397	47 58 51	2413	49 42 7	2429
	Jupiter	W.	34 7 56	2311	35 53 39	2328	37 38 57	2346	39 23 50	2363
	α Aquilæ	E.	56 18 59	3110	54 51 1	3163	53 24 7	3219	51 58 20	3280
	Fomalhaut	E.	88 5 44	2615	86 27 9	2635	84 49 1	2655	83 11 20	2675
	Sun	E.	134 47 6	2666	133 9 40	2684	131 32 39	2703	129 56 3	2722
12	Spica	W.	58 12 31	2516	59 53 22	2533	61 33 49	2551	63 13 51	2569
	Jupiter	W.	48 1 55	2453	49 44 15	2470	51 26 10	2489	53 7 39	2507
	α Aquilæ	E.	45 8 39	3656	43 51 5	3751	42 35 12	3855	41 21 6	3966
	Fomalhaut	E.	75 10 9	2788	73 35 26	2813	72 1 15	2838	70 27 36	2863
	α Pegasi	E.	90 6 26	2795	88 31 52	2815	86 57 43	2834	85 23 59	2854
	Sun	E.	121 59 34	2822	120 25 35	2842	118 52 1	2862	117 18 53	2882
13	Spica	W.	71 27 54	2658	73 5 30	2675	74 42 43	2692	76 19 33	2710
	Jupiter	W.	61 28 48	2596	63 7 48	2614	64 46 24	2631	66 24 37	2648
	Antares	W.	26 44 20	2931	28 16 0	2917	29 47 57	2909	31 20 4	2905
	Fomalhaut	E.	62 47 47	3001	61 17 35	3030	59 47 59	3060	58 19 1	3092
	α Pegasi	E.	77 42 2	2962	76 11 1	2985	74 40 29	3008	73 10 26	3031
	Sun	E.	109 39 34	2980	108 8 56	2999	106 38 42	3018	105 8 52	3037
14	Spica	W.	84 18 9	2792	85 52 48	2807	87 27 7	2822	89 1 6	2837
	Jupiter	W.	74 30 4	2729	76 6 5	2745	77 41 45	2760	79 17 6	2775
	Antares	W.	39 0 57	2916	40 32 55	2923	42 4 45	2930	43 36 26	2937
	Fomalhaut	E.	51 4 14	3268	49 39 25	3307	48 15 22	3350	46 52 8	3394
	α Pegasi	E.	65 47 32	3154	64 20 28	3181	62 53 56	3207	61 27 55	3235
	Sun	E.	97 45 20	3126	96 17 42	3143	94 50 25	3160	93 23 28	3176
15	Spica	W.	96 46 22	2907	98 18 32	2920	99 50 26	2932	101 22 4	2944
	Jupiter	W.	87 9 10	2842	88 42 43	2855	90 16 0	2867	91 49 1	2879
	Antares	W.	51 12 23	2979	52 43 2	2988	54 13 30	2997	55 43 47	3005
	Fomalhaut	E.	40 9 34	3663	38 52 8	3730	37 35 53	3805	36 20 56	3885
	α Pegasi	E.	54 26 15	3386	53 3 42	3419	51 41 47	3454	50 20 31	3490
	Sun	E.	86 13 23	3252	84 48 15	3265	83 23 23	3278	81 58 46	3292
16	Jupiter	W.	99 30 32	2931	101 2 11	2940	102 33 39	2950	104 4 55	2958
	Antares	W.	63 12 40	3045	64 41 57	3052	66 11 5	3060	67 40 4	3067
	α Pegasi	E.	43 45 10	3710	42 28 34	3763	41 12 53	3821	39 58 13	3884
	Sun	E.	74 59 21	3350	73 36 7	3360	72 13 5	3371	70 50 15	3380
17	Antares	W.	75 2 58	3096	76 31 12	3102	77 59 19	3106	79 27 21	3111
	α Aquilæ	W.	36 22 26	4871	37 21 4	4752	38 21 20	4646	39 23 5	4551

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9	Regulus	W.	76° 19′ 36″	2130	78° 9′ 49″	2145	79° 59′ 40″	2160	81° 49′ 8″	2176
	Spica	W.	23 22 16	2289	25 8 31	2283	26 54 55	2282	28 41 21	2284
	α Aquilæ	E.	75 0 43	2675	73 23 29	2699	71 46 48	2726	70 10 43	2754
10	Regulus	W.	90 50 30	2258	92 37 32	2275	94 24 8	2294	96 10 17	2312
	Spica	W.	37 31 38	2326	39 17 0	2339	41 2 3	2352	42 46 47	2366
	Jupiter	W.	27 1 21	2251	28 48 32	2266	30 35 22	2281	32 21 50	2296
	α Aquilæ	E.	62 20 29	2927	60 48 45	2969	59 17 54	3014	57 47 58	3060
	Fomalhaut	E.	94 44 11	2544	93 3 59	2561	91 24 10	2578	89 44 45	2596
11	Regulus	W.	104 54 23	2405	106 37 51	2424	108 20 52	2442	110 3 27	2460
	Spica	W.	51 25 0	2446	53 7 29	2463	54 49 34	2480	56 31 15	2498
	Jupiter	W.	41 8 18	2380	42 52 21	2398	44 35 58	2417	46 19 9	2434
	α Aquilæ	E.	50 33 45	3345	49 10 25	3414	47 48 24	3488	46 27 47	3569
	Fomalhaut	E.	81 34 7	2697	79 57 23	2719	78 21 8	2741	76 45 23	2765
	Sun	E.	128 19 53	2742	126 44 9	2762	125 8 51	2782	123 33 59	2802
12	Spica	W.	64 53 28	2587	66 32 41	2604	68 11 30	2623	69 49 54	2640
	Jupiter	W.	54 48 43	2525	56 29 21	2543	58 9 34	2561	59 49 23	2578
	α Aquilæ	E.	40 8 53	4089	38 58 41	4226	37 50 39	4375	36 44 55	4540
	Fomalhaut	E.	68 54 30	2889	67 21 57	2916	65 49 59	2943	64 18 35	2972
	α Pegasi	E.	83 50 41	2875	82 17 50	2897	80 45 27	2918	79 13 31	2939
	Sun	E.	115 46 11	2901	114 13 54	2922	112 42 3	2941	111 10 36	2961
13	Spica	W.	77 56 0	2726	79 32 5	2743	81 7 48	2760	82 43 9	2775
	Jupiter	W.	68 2 27	2665	69 39 54	2681	71 16 59	2698	72 53 42	2713
	Antares	W.	32 52 16	2904	34 24 30	2905	35 56 43	2907	37 28 53	2912
	Fomalhaut	E.	56 50 42	3125	55 23 3	3158	53 56 4	3193	52 29 47	3231
	α Pegasi	E.	71 40 52	3055	70 11 47	3079	68 43 12	3104	67 15 7	3129
	Sun	E.	103 39 25	3056	102 10 21	3073	100 41 39	3091	99 13 19	3109
14	Spica	W.	90 34 46	2852	92 8 7	2866	93 41 10	2880	95 13 55	2894
	Jupiter	W.	80 52 7	2789	82 26 49	2803	84 1 13	2816	85 35 20	2829
	Antares	W.	45 7 58	2945	46 39 20	2953	48 10 32	2962	49 41 33	2970
	Fomalhaut	E.	45 29 45	3441	44 8 15	3491	42 47 41	3545	41 28 6	3602
	α Pegasi	E.	60 2 27	3263	58 37 32	3292	57 13 11	3322	55 49 25	3353
	Sun	E.	91 56 50	3192	90 30 31	3208	89 4 31	3222	87 38 48	3237
15	Spica	W.	102 53 27	2956	104 24 35	2967	105 55 29	2978	107 26 9	2989
	Jupiter	W.	93 21 47	2890	94 54 19	2901	96 26 37	2912	97 58 41	2922
	Antares	W.	57 13 54	3013	58 43 51	3022	60 13 37	3030	61 43 13	3037
	Fomalhaut	E.	35 7 21	3973	33 55 15	4071	32 44 45	4181	31 36 1	4304
	α Pegasi	E.	48 59 56	3529	47 40 4	3570	46 20 57	3614	45 2 38	3662
	Sun	E.	80 34 25	3304	79 10 18	3317	77 46 26	3328	76 22 47	3339
16	Jupiter	W.	105 36 1	2965	107 6 57	2973	108 37 43	2981	110 8 20	2987
	Antares	W.	69 8 54	3073	70 37 36	3079	72 6 11	3086	73 34 38	3091
	α Pegasi	E.	38 44 37	3952	37 32 10	4028	36 20 58	4110	35 11 6	4202
	Sun	E.	69 27 36	3389	68 5 7	3397	66 42 47	3406	65 20 37	3414
17	Antares	W.	80 55 17	3115	82 23 8	3119	83 50 55	3123	85 18 37	3126
	α Aquilæ	W.	40 26 12	4466	41 30 34	4388	42 36 6	4318	43 42 42	4255

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17	**Sun**	E.	63° 58′ 36″	3431	62° 36′ 43″	3428	61° 14′ 58″	3434	59° 53′ 20″	3440
18	Antares	W.	86 46 15	3129	88 13 49	3132	89 41 20	3133	91 8 49	3135
	α Aquilæ	W.	44 50 16	4197	45 58 45	4144	47 8 4	4097	48 18 9	4052
	Sun	E.	53 6 45	3465	51 45 42	3469	50 24 43	3472	49 3 48	3476
19	Antares	W.	98 25 42	3142	99 53 1	3143	101 20 19	3143	102 47 36	3143
	α Aquilæ	W.	54 18 23	3878	55 32 5	3850	56 46 16	3823	58 0 54	3799
	Sun	E.	42 20 3	3488	40 59 26	3490	39 38 51	3492	38 18 18	3493
20	α Aquilæ	W.	64 19 49	3699	65 36 37	3682	66 53 43	3667	68 11 5	3652
	Fomalhaut	W.	31 31 50	4311	32 38 32	4212	33 46 47	4122	34 56 27	4043
	Sun	E.	31 35 57	3501	30 15 34	3504	28 55 14	3507	27 34 58	3510
24	**Sun**	W.	13 37 29	3594	14 57 27	3472	16 18 22	3432	17 40 2	3400
	Saturn	E.	60 18 22	2946	58 47 2	2939	57 15 33	2932	55 43 55	2925
	Pollux	E.	65 54 2	2986	64 23 32	2981	62 52 55	2976	61 22 12	2970
	Regulus	E.	101 35 13	2914	100 3 12	2907	98 31 2	2899	96 58 42	2892
25	**Sun**	W.	24 36 8	3289	26 0 32	3274	27 25 14	3259	28 50 14	3244
	Saturn	E.	48 3 32	2890	46 31 0	2883	44 58 19	2876	43 25 30	2869
	Pollux	E.	53 47 6	2948	52 15 48	2945	50 44 26	2941	49 12 59	2938
	Regulus	E.	89 14 43	2855	87 41 26	2847	86 7 59	2839	84 34 22	2831
26	**Sun**	W.	35 59 17	3179	37 25 51	3168	38 52 39	3156	40 19 41	3144
	Saturn	E.	35 39 2	2832	34 5 16	2825	32 31 21	2819	30 57 18	2812
	Pollux	E.	41 34 57	2931	40 3 17	2931	38 31 37	2933	37 0 0	2937
	Regulus	E.	76 43 37	2789	75 8 55	2781	73 34 2	2772	71 58 57	2763
27	**Sun**	W.	47 38 23	3087	49 6 49	3074	50 35 30	3063	52 4 25	3051
	Aldebaran	W.	16 8 42	2719	17 44 57	2709	19 21 25	2698	20 58 7	2689
	Regulus	E.	64 0 33	2716	62 24 15	2707	60 47 44	2697	59 11 0	2687
28	**Sun**	W.	59 32 40	2992	61 3 3	2979	62 33 42	2967	64 4 36	2954
	Aldebaran	W.	29 5 2	2636	30 43 8	2625	32 21 29	2615	34 0 4	2603
	Venus	W.	25 38 5	3186	27 4 31	3161	28 31 27	3138	29 58 50	3117
	Regulus	E.	51 3 56	2635	49 25 49	2625	47 47 28	2614	46 8 52	2602
	Spica	E.	104 45 26	2663	103 7 56	2652	101 30 12	2641	99 52 13	2629
29	**Sun**	W.	71 43 3	2891	73 15 33	2879	74 48 19	2866	76 21 22	2852
	Aldebaran	W.	42 16 53	2546	43 57 2	2534	45 37 28	2522	47 18 10	2510
	Venus	W.	37 21 58	3022	38 51 44	3004	40 21 52	2987	41 52 21	2970
	Regulus	E.	37 51 59	2545	36 11 49	2534	34 31 23	2522	32 50 40	2510
	Spica	E.	91 38 23	2572	89 58 50	2560	88 19 0	2548	86 38 54	2536
	Jupiter	E.	99 30 40	2512	97 49 43	2499	96 8 29	2488	94 26 59	2476
30	**Sun**	W.	84 10 54	2785	85 45 41	2772	87 20 45	2759	88 56 7	2746
	Aldebaran	W.	55 45 55	2449	57 28 20	2437	59 11 2	2424	60 54 2	2412
	Venus	W.	49 29 54	2890	51 2 26	2875	52 35 17	2859	54 8 28	2844
	Saturn	W.	16 48 23	2543	18 28 36	2519	20 9 23	2497	21 50 40	2478
	Spica	E.	78 14 14	2477	76 32 28	2465	74 50 25	2453	73 8 5	2441
	Jupiter	E.	85 55 16	2416	84 12 4	2403	82 28 34	2391	80 44 47	2379

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17	Sun	E.	58° 31′ 49″	3446	57° 10′ 25″	3451	55° 49′ 6″	3456	54° 27′ 53″	3461
18	Antares	W.	92 36 16	3137	94 3 41	3139	95 31 3	3141	96 58 23	3142
	α Aquilæ	W.	49 28 57	4012	50 40 25	3973	51 52 31	3939	53 5 11	3908
	Sun	E.	47 42 57	3479	46 22 9	3481	45 1 24	3484	43 40 42	3487
19	Antares	W.	104 14 53	3143	105 42 10	3143	107 9 27	3143	108 36 45	3142
	α Aquilæ	W.	59 15 57	3777	60 31 23	3756	61 47 11	3736	63 3 20	3717
	Sun	E.	36 57 46	3495	35 37 16	3497	34 16 48	3498	32 56 22	3499
20	α Aquilæ	W.	69 28 43	3638	70 46 36	3624	72 4 44	3612	73 23 5	3600
	Fomalhaut	W.	36 7 24	3973	37 19 30	3911	38 32 39	3853	39 46 47	3801
	Sun	E.	26 14 45	3514	24 54 36	3518	23 34 32	3525	22 14 35	3534
24	Sun	W.	19 2 19	3372	20 25 7	3348	21 48 23	3326	23 12 4	3306
	Saturn	E.	54 12 8	2919	52 40 13	2912	51 8 9	2904	49 35 55	2897
	Pollux	E.	59 51 22	2965	58 20 26	2962	56 49 25	2957	55 18 18	2953
	Regulus	E.	95 26 13	2885	93 53 35	2877	92 20 47	2870	90 47 50	2862
25	Sun	W.	30 15 31	3230	31 41 5	3217	33 6 54	3204	34 32 58	3192
	Saturn	E.	41 52 32	2862	40 19 24	2854	38 46 6	2847	37 12 39	2839
	Pollux	E.	47 41 28	2935	46 9 53	2933	44 38 16	2931	43 6 37	2931
	Regulus	E.	83 0 34	2823	81 26 36	2815	79 52 27	2807	78 18 8	2798
26	Sun	W.	41 46 57	3133	43 14 27	3120	44 42 12	3109	46 10 11	3098
	Saturn	E.	29 23 6	2805	27 48 45	2799	26 14 16	2794	24 39 40	2789
	Pollux	E.	35 28 28	2942	33 57 2	2948	32 25 44	2957	30 54 38	2970
	Regulus	E.	70 23 40	2754	68 48 12	2744	67 12 31	2735	65 36 38	2726
27	Sun	W.	53 33 35	3039	55 2 59	3027	56 32 38	3015	58 2 32	3004
	Aldebaran	W.	22 35 2	2678	24 12 11	2668	25 49 34	2657	27 27 11	2647
	Regulus	E.	57 34 3	2677	55 56 52	2666	54 19 27	2657	52 41 49	2646
28	Sun	W.	65 35 46	2942	67 7 11	2930	68 38 52	2917	70 10 49	2904
	Aldebaran	W.	35 38 55	2592	37 18 1	2580	38 57 23	2569	40 37 0	2558
	Venus	W.	31 26 39	3096	32 54 53	3076	34 23 32	3057	35 52 34	3039
	Regulus	E.	44 30 0	2591	42 50 53	2580	41 11 31	2569	39 31 53	2557
	Spica	E.	98 13 58	2618	96 35 28	2607	94 56 42	2595	93 17 40	2584
29	Sun	W.	77 54 42	2839	79 28 19	2826	81 2 13	2812	82 36 25	2799
	Aldebaran	W.	48 59 9	2498	50 40 25	2486	52 21 58	2474	54 3 48	2462
	Venus	W.	43 23 11	2954	44 54 21	2938	46 25 52	2922	47 57 43	2906
	Regulus	E.	31 9 41	2498	29 28 25	2486	27 46 52	2473	26 5 1	2461
	Spica	E.	84 58 31	2525	83 17 52	2512	81 36 56	2500	79 55 43	2489
	Jupiter	E.	92 45 12	2465	91 3 9	2453	89 20 49	2440	87 38 11	2428
30	Sun	W.	90 31 46	2732	92 7 43	2719	93 43 58	2705	95 20 31	2692
	Aldebaran	W.	62 37 20	2399	64 20 56	2387	66 4 50	2374	67 49 2	2362
	Venus	W.	55 41 59	2829	57 15 49	2814	58 49 59	2798	60 24 29	2784
	Saturn	W.	23 32 24	2460	25 14 34	2443	26 57 8	2427	28 40 4	2412
	Spica	E.	71 25 28	2429	69 42 34	2417	67 59 23	2405	66 15 55	2394
	Jupiter	E.	79 0 42	2366	77 16 19	2355	75 31 39	2342	73 46 41	2330

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
SUN.	1	2 33 23.13	9.539	N.15 3 49.4	+45.40	15 54.27	66.05	2 59.83	0.316
Mon.	2	2 37 12.33	9.561	15 21 51.4	44.77	15 54.04	66.13	3 7.17	0.294
Tues.	3	2 41 2.05	9.583	15 39 38.2	44.13	15 53.81	66.21	3 13.98	0.272
Wed.	4	2 44 52 31	9.606	15 57 9.4	+43.47	15 53.59	66.29	3 20.26	0.249
Thur.	5	2 48 43.12	9.628	16 14 24.7	42.80	15 53.36	66.37	3 25.99	0.227
Frid.	6	2 52 34.48	9.651	16 31 23.8	42.12	15 53.14	66.45	3 31.17	0.204
Sat.	7	2 56 26.40	9.676	16 48 6.4	+41.43	15 52.92	66.53	3 35.79	0.180
SUN.	8	3 0 18.89	9.700	17 4 32.3	40.72	15 52.70	66.62	3 39.84	0.156
Mon.	9	3 4 11.96	9.724	17 20 41.1	40.00	15 52.48	66.70	3 43.32	0.132
Tues.	10	3 8 5.61	9.748	17 36 32.5	+39.27	15 52.27	66.78	3 46.21	0.108
Wed.	11	3 11 59.85	9.772	17 52 6.3	38.54	15 52.05	66.86	3 48.52	0.084
Thur.	12	3 15 54.68	9.797	18 7 22.4	37.79	15 51.84	66.95	3 50.25	0.059
Frid.	13	3 19 50.10	9.822	18 22 20.3	+37.03	15 51.63	67.03	3 51.38	0.034
Sat.	14	3 23 46.12	9.847	18 36 59.7	36.25	15 51.43	67.11	3 51.91	0.009
SUN.	15	3 27 42.73	9.872	18 51 20.2	35.47	15 51.22	67.19	3 51.85	0.016
Mon.	16	3 31 39.94	9.896	19 5 21.8	+34.67	15 51.02	67.27	3 51.20	0.040
Tues.	17	3 35 37.73	9.920	19 19 4.1	33.86	15 50.82	67.35	3 49.97	0.064
Wed.	18	3 39 36.10	9.944	19 32 26.9	33.04	15 50.63	67.43	3 48.16	0.088
Thur.	19	3 43 35.03	9.967	19 45 29.8	+32.20	15 50.44	67.51	3 45.79	0.111
Frid.	20	3 47 34.53	9.990	19 58 12.8	31.36	15 50.25	67.59	3 42.86	0.134
Sat.	21	3 51 34.58	10.013	20 10 35.4	30.50	15 50.07	67.67	3 39.37	0.157
SUN.	22	3 55 35.18	10.037	20 22 37.3	+29.64	15 49.89	67.74	3 35.34	0.180
Mon.	23	3 59 36.31	10.059	20 34 18.3	28.76	15 49.72	67.82	3 30.78	0.202
Tues.	24	4 3 37.95	10.080	20 45 38.2	27.88	15 49.55	67.89	3 25.71	0.223
Wed.	25	4 7 40.10	10.101	20 56 36.8	+26.98	15 49.39	67.96	3 20.13	0.244
Thur.	26	4 11 42.74	10.120	21 7 13.7	26.08	15 49.23	68.03	3 14.06	0.263
Frid.	27	4 15 45.85	10.139	21 17 28.7	25.16	15 49.07	68.10	3 7.52	0.282
Sat.	28	4 19 49.42	10.158	21 27 21.7	+24.24	15 48.92	68.17	3 0.53	0.301
SUN.	29	4 23 53 44	10.176	21 36 52.3	23.30	15 48.78	68.23	2 53.09	0.319
Mon.	30	4 27 57.88	10.194	21 46 0.4	22.36	15 48.64	68.29	2 45.22	0.337
Tues.	31	4 32 2.74	10.211	21 54 45.9	21.41	15 48.50	68.35	2 36.94	0.354
Wed.	32	4 36 8.00	10.227	N.22 3 8.5	+20.46	15 48.37	68.41	2 28.26	0.370

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^s.18$ from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
SUN.	1	2 33 23.61	9.540	N. 15 3 51.7	+45.40	2 59.85	0.316	2 36 23.46
Mon.	2	2 37 12.83	9.562	15 21 53.8	44.77	3 7.19	0.294	2 40 20.01
Tues.	3	2 41 2.57	9.584	15 39 40.6	44.13	3 14.00	0.272	2 44 16.57
Wed.	4	2 44 52.85	9.607	15 57 11 9	+43.47	3 20.27	0.249	2 48 13.12
Thur.	5	2 48 43.68	9.629	16 14 27.2	42.80	3 26.00	0.227	2 52 9.68
Frid.	6	2 52 35.06	9.652	16 31 26.3	42.12	3 31.18	0.204	2 56 6.23
Sat.	7	2 56 26.99	9.676	16 48 8.9	+41.43	3 35.80	0.180	3 0 2.79
SUN.	8	3 0 19.49	9.700	17 4 34.8	40.72	3 39.85	0.156	3 3 59.34
Mon.	9	3 4 12.57	9.724	17 20 43.6	40.00	3 43.33	0.132	3 7 55.90
Tues.	10	3 8 6.23	9.748	17 36 35.0	+39.27	3 46.22	0.108	3 11 52.45
Wed.	11	3 12 0.48	9.772	17 52 8.8	38.54	3 48.53	0.084	3 15 49.01
Thur.	12	3 15 55.32	9.797	18 7 24.8	37.79	3 50.25	0.059	3 19 45.56
Frid.	13	3 19 50.74	9.822	18 22 22.6	+37.03	3 51.38	0.034	3 23 42.12
Sat.	14	3 23 46.76	9.847	18 37 1.9	36.25	3 51.91	0.009	3 27 38.67
SUN.	15	3 27 43.37	9.872	18 51 22.4	35.47	3 51.85	0.016	3 31 35.23
Mon.	16	3 31 40.58	9.896	19 5 24.0	+34.67	3 51.20	0.040	3 35 31.78
Tues.	17	3 35 38.37	9.920	19 19 6.3	33.86	3 49.97	0.064	3 39 28.34
Wed.	18	3 39 36.73	9.944	19 32 29.0	33.04	3 48.16	0.088	3 43 24.89
Thur.	19	3 43 35.66	9.967	19 45 31.9	+32.20	3 45.79	0.111	3 47 21.45
Frid.	20	3 47 35.15	9.990	19 58 14.8	31.36	3 42.85	0.134	3 51 18.00
Sat.	21	3 51 35.19	10.013	20 10 37.3	30.50	3 39.37	0.157	3 55 14.56
SUN.	22	3 55 35.78	10.036	20 22 39.1	+29.64	3 35.33	0.180	3 59 11.11
Mon.	23	3 59 36.90	10.058	20 34 20.0	28.76	3 30.77	0.202	4 3 7.67
Tues.	24	4 3 38.53	10.079	20 45 39.8	27.88	3 25.70	0.223	4 7 4.23
Wed.	25	4 7 40.67	10.100	20 56 38.3	+26.98	3 20.12	0.244	4 11 0.79
Thur.	26	4 11 43.29	10.119	21 7 15.1	26.08	3 14.05	0.263	4 14 57.34
Frid.	27	4 15 46.38	10.138	21 17 30.0	25.16	3 7.52	0.282	4 18 53.90
Sat.	28	4 19 49.93	10.157	21 27 22.9	+24.24	3 0.52	0.301	4 22 50.45
SUN.	29	4 23 53.93	10.175	21 36 53.4	23.30	2 53.08	0.319	4 26 47.01
Mon.	30	4 27 58.35	10.193	21 46 1.4	22.36	2 45.21	0.337	4 30 43.56
Tues.	31	4 32 3.19	10.210	21 54 46.8	21.41	2 36.93	0.354	4 34 40.12
Wed.	32	4 36 8.43	10.226	N. 22 3 9.3	+20.46	2 28.25	0.370	4 38 36.68

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour,
+ 9s.8565.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	121	40 46 43.5	46 38.4	145.44	− 0.19	0.0035016	+ 43.7	21 20 6.26
2	122	41 44 53.2	44 48.0	145.36	− 0.05	0.0036061	43.3	21 16 10.35
3	123	42 43 1.0	42 55.7	145.28	+ 0.08	0.0037097	43.0	21 12 14.44
4	124	43 41 6.9	41 1.5	145.21	+ 0.20	0.0038125	+ 42.7	21 8 18.53
5	125	44 39 10.9	39 5.4	145.13	0.30	0.0039146	42.4	21 4 22.62
6	126	45 37 13.2	37 7.5	145.06	0.37	0.0040161	42.2	21 0 26.71
7	127	46 35 13.7	35 7.9	144.98	+ 0.41	0.0041171	+ 41.9	20 56 30.80
8	128	47 33 12.5	33 6.6	144.92	0.42	0.0042174	41.7	20 52 34.89
9	129	48 31 9.8	31 3.7	144.85	0.40	0.0043170	41.4	20 48 38.98
10	130	49 29 5.6	28 59.4	144.79	+ 0.35	0.0044159	+ 41.0	20 44 43.07
11	131	50 27 0.0	26 53.7	144.73	0.27	0.0045139	40.7	20 40 47.16
12	132	51 24 53.2	24 46.8	144.68	0.17	0.0046110	40.3	20 36 51.25
13	133	52 22 45.1	22 38.6	144.63	+ 0.06	0.0047072	+ 39.8	20 32 55.34
14	134	53 20 35.8	20 29.1	144.58	− 0.06	0.0048022	39.3	20 28 59.43
15	135	54 18 25.2	18 18.3	144.53	0.19	0.0048959	38.7	20 25 3.53
16	136	55 16 13.5	16 6.5	144.49	− 0.31	0.0049881	+ 38.1	20 21 7.62
17	137	56 14 0.7	13 53.6	144.44	0.43	0.0050786	37.4	20 17 11.71
18	138	57 11 46.7	11 39.5	144.39	0.53	0.0051673	36.6	20 13 15.80
19	139	58 9 31.6	9 24.2	144.34	− 0.61	0.0052541	+ 35.8	20 9 19.89
20	140	59 7 15.3	7 7.7	144.31	0.66	0.0053390	34.9	20 5 23.98
21	141	60 4 57.8	4 50.1	144.25	0.68	0.0054217	34.0	20 1 28.07
22	142	61 2 39.1	2 31.3	144.19	− 0.67	0.0055022	+ 33.0	19 57 32.16
23	143	62 0 19.1	0 11.2	144.13	0.63	0.0055805	32.1	19 53 36.25
24	144	62 57 57.8	57 49.7	144.08	0.56	0.0056565	31.2	19 49 40.34
25	145	63 55 35.3	55 27.0	144.02	− 0.47	0.0057304	+ 30.3	19 45 44.43
26	146	64 53 11.3	53 2.9	143.97	0.36	0.0058021	29.5	19 41 48.52
27	147	65 50 45.9	50 37.4	143.91	0.23	0.0058717	28.6	19 37 52.61
28	148	66 48 19.2	48 10.5	143.86	− 0.09	0.0059393	+ 27.8	19 33 56.70
29	149	67 45 51.1	45 42.2	143.80	+ 0.05	0.0060050	27.0	19 30 0.79
30	150	68 43 21.6	43 12.5	143.74	0.17	0.0060689	26.3	19 26 4.88
31	151	69 40 50.8	40 41.6	143.69	0.29	0.0061312	25.7	19 22 8.96
32	152	70 38 18.7	38 9.4	143.64	+ 0.39	0.0061920	+ 25.1	19 18 13.05

Note.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January $0^d.0$.

Diff. for 1 Hour,
— $9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 3.9	16 9.3	58 51.0	+1.66	59 10.6	+1.60	6 58.8	2.26	8.1
2	16 14.4	16 19.1	59 29.4	1.51	59 46.8	1.38	7 52.8	2.24	9.1
3	16 23.4	16 27.0	60 2.4	1.21	60 15.8	1.00	8 46.6	2.24	10.1
4	16 29.9	16 31.9	60 26.4	+0.75	60 33.8	+0.47	9 40.4	2.25	11.1
5	16 33.0	16 33.0	60 37.7	+0.17	60 37.8	−0.16	10 34.6	2.28	12.1
6	16 32.0	16 29.8	60 33.9	−0.49	60 26.0	0.82	11 29.7	2.32	13.1
7	16 26.6	16 22.4	60 14.3	−1.13	59 58.9	−1.42	12 25.7	2.35	14.1
8	16 17.4	16 11.6	59 40.3	1.66	59 19.0	1.87	13 22.4	2.36	15.1
9	16 5.1	15 58.3	58 55.4	2.03	58 30.2	2.14	14 19.0	2.35	16.1
10	15 51.2	15 43.9	58 4.1	−2.20	57 37.5	−2.21	15 14.6	2.28	17.1
11	15 36.7	15 29.7	57 11.0	2.18	56 45.1	2.11	16 8.3	2.18	18.1
12	15 22.9	15 16.6	56 20.4	2.00	55 57.2	1.86	16 59.5	2.07	19.1
13	15 10.8	15 5.5	55 35.7	−1.70	55 16.3	−1.52	17 47.9	1.96	20.1
14	15 0.8	14 56.8	54 59.2	1.33	54 44.4	1.13	18 33.8	1.86	21.1
15	14 53.5	14 50.8	54 32.1	0.92	54 22.4	0.70	19 17.7	1.79	22.1
16	14 48.9	14 47.6	54 15.2	−0.50	54 10.5	−0.29	20 0.3	1.75	23.1
17	14 47.0	14 47.0	54 8.2	−0.10	54 8.2	+0.10	20 42.2	1.75	24.1
18	14 47.6	14 48.7	54 10.5	+0.28	54 14.8	0.44	21 24.3	1.77	25.1
19	14 50.4	14 52.6	54 21.0	+0.59	54 28.9	+0.73	22 7.3	1.82	26.1
20	14 55.2	14 58.1	54 38.4	0.85	54 49.2	0.95	22 51.8	1.89	27.1
21	15 1.4	15 4.9	55 1.2	1.04	55 14.1	1.11	23 38.3	1.99	28.1
22	15 8.6	15 12.5	55 27.8	+1.16	55 42.0	+1.21	δ		29.1
23	15 16.5	15 20.6	55 56.7	1.24	56 11.7	1.26	0 27.2	2.09	0.5
24	15 24.7	15 28.8	56 26.8	1.26	56 41.9	1.26	1 18.5	2.18	1.5
25	15 32.9	15 37.0	56 57.0	+1.26	57 12.0	+1.24	2 11.8	2.25	2.5
26	15 41.0	15 45.0	57 26.8	1.23	57 41.4	1.21	3 6.2	2.28	3.5
27	15 48.9	15 52.7	57 55.8	1.18	58 9.8	1.15	4 0.9	2.27	4.5
28	15 56.4	16 0.0	58 23.4	+1.12	58 36.6	+1.08	4 55.2	2.24	5.5
29	16 3.5	16 6.7	58 49.3	1.03	59 1.2	0.96	5 48.5	2.20	6.5
30	16 9.7	16 12.5	59 12.3	0.88	59 22.4	0.78	6 41.0	2.17	7.5
31	16 14.9	16 16.8	59 31.1	0.66	59 38.3	0.53	7 33.0	2.16	8.5
32	16 18.3	16 19.3	59 43.8	+0.37	59 47.2	+0.19	8 25.1	2.18	9.5

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 19 54.91	2.3479	N.14 56 8.0	7.685
1	9 22 15.77	2.3473	14 48 24.0	7.782
2	9 24 36.59	2.3467	14 40 34.2	7.878
3	9 26 57.38	2.3462	14 32 38.6	7.974
4	9 29 18.13	2.3456	14 24 37.3	8.069
5	9 31 38.85	2.3450	14 16 30.3	8.163
6	9 33 59.53	2.3443	14 8 17.7	8.256
7	9 36 20.17	2.3437	13 59 59.5	8.349
8	9 38 40.78	2.3431	13 51 35.8	8.442
9	9 41 1.35	2.3425	13 43 6.5	8.533
10	9 43 21.88	2.3418	13 34 31.8	8.623
11	9 45 42.37	2.3412	13 25 51.7	8.713
12	9 48 2.83	2.3406	13 17 6.2	8.802
13	9 50 23.25	2.3400	13 8 15.4	8.891
14	9 52 43.63	2.3393	12 59 19.3	8.978
15	9 55 3.97	2.3387	12 50 18.0	9.064
16	9 57 24.27	2.3380	12 41 11.6	9.149
17	9 59 44.53	2.3374	12 32 0.1	9.234
18	10 2 4.76	2.3368	12 22 43.5	9.318
19	10 4 24.95	2.3362	12 13 21.9	9.402
20	10 6 45.10	2.3355	12 3 55.3	9.484
21	10 9 5.21	2.3348	11 54 23.8	9.565
22	10 11 25.28	2.3342	11 44 47.5	9.645
23	10 13 45.32	2.3336	N.11 35 6.4	9.725

MONDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 16 5.32	2.3330	N.11 25 20.5	9.804
1	10 18 25.28	2.3324	11 15 29.9	9.882
2	10 20 45.21	2.3318	11 5 34.7	9.958
3	10 23 5.10	2.3312	10 55 35.0	10.033
4	10 25 24.96	2.3307	10 45 30.8	10.108
5	10 27 44.79	2.3302	10 35 22.1	10.183
6	10 30 4.58	2.3296	10 25 8.9	10.256
7	10 32 24.34	2.3291	10 14 51.4	10.327
8	10 34 44.07	2.3285	10 4 29.7	10.397
9	10 37 3.76	2.3280	9 54 3.8	10.466
10	10 39 23.43	2.3276	9 43 33.8	10.535
11	10 41 43.07	2.3271	9 32 59.6	10.603
12	10 44 2.68	2.3266	9 22 21.4	10.669
13	10 46 22.26	2.3261	9 11 39.3	10.734
14	10 48 41.81	2.3257	9 0 53.3	10.799
15	10 51 1.34	2.3253	8 50 3.4	10.862
16	10 53 20.85	2.3249	8 39 9.8	10.924
17	10 55 40.33	2.3245	8 28 12.5	10.986
18	10 57 59.79	2.3242	8 17 11.5	11.046
19	11 0 19.23	2.3238	8 6 7.0	11.104
20	11 2 38.65	2.3235	7 54 59.0	11.162
21	11 4 58.05	2.3232	7 43 47.6	11.218
22	11 7 17.44	2.3230	7 32 32.9	11.273
23	11 9 36.81	2.3227	7 21 14.8	11.328
24	11 11 56.16	2.3224	N. 7 9 53.5	11.381

TUESDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 11 56.16	2.3224	N. 7 9 53.5	11.381
1	11 14 15.50	2.3222	6 58 29.1	11.432
2	11 16 34.83	2.3221	6 47 1.6	11.483
3	11 18 54.15	2.3219	6 35 31.1	11.532
4	11 21 13.46	2.3217	6 23 57.7	11.580
5	11 23 32.76	2.3216	6 12 21.5	11.627
6	11 25 52.05	2.3215	6 0 42.5	11.673
7	11 28 11.34	2.3215	5 49 0.8	11.716
8	11 30 30.63	2.3214	5 37 16.5	11.759
9	11 32 49.91	2.3214	5 25 29.7	11.802
10	11 35 9.20	2.3215	5 13 40.3	11.843
11	11 37 28.49	2.3215	5 1 48.5	11.882
12	11 39 47.78	2.3216	4 49 54.4	11.920
13	11 42 7.08	2.3217	4 37 58.1	11.957
14	11 44 26.38	2.3218	4 25 59.6	11.992
15	11 46 45.69	2.3219	4 13 59.1	12.025
16	11 49 5.01	2.3221	4 1 56.6	12.058
17	11 51 24.35	2.3224	3 49 52.1	12.091
18	11 53 43.70	2.3226	3 37 45.7	12.121
19	11 56 3.06	2.3229	3 25 37.6	12.148
20	11 58 22.44	2.3232	3 13 27.9	12.175
21	12 0 41.84	2.3235	3 1 16.6	12.202
22	12 3 1.26	2.3238	2 49 3.7	12.227
23	12 5 20.70	2.3242	N. 2 36 49.3	12.251

WEDNESDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 7 40.16	2.3246	N. 2 24 33.6	12.272
1	12 9 59.65	2.3251	2 12 16.6	12.292
2	12 12 19.17	2.3255	1 59 58.5	12.311
3	12 14 38.71	2.3260	1 47 39.3	12.328
4	12 16 58.29	2.3266	1 35 19.1	12.345
5	12 19 17.90	2.3271	1 22 57.9	12.360
6	12 21 37.54	2.3277	1 10 35.9	12.373
7	12 23 57.22	2.3283	0 58 13.1	12.386
8	12 26 16.94	2.3290	0 45 49.6	12.396
9	12 28 36.70	2.3297	0 33 25.6	12.404
10	12 30 56.50	2.3304	0 21 1.1	12.412
11	12 33 16.34	2.3311	N. 0 8 36.1	12.419
12	12 35 36.23	2.3319	S. 0 3 49.2	12.423
13	12 37 56.17	2.3327	0 16 14.7	12.426
14	12 40 16.15	2.3334	0 28 40.3	12.428
15	12 42 36.18	2.3343	0 41 6.1	12.430
16	12 44 56.26	2.3352	0 53 31.9	12.428
17	12 47 16.40	2.3361	1 5 57.5	12.425
18	12 49 36.59	2.3370	1 18 22.9	12.421
19	12 51 56.84	2.3380	1 30 48.0	12.416
20	12 54 17.15	2.3389	1 43 12.8	12.409
21	12 56 37.51	2.3399	1 55 37.1	12.400
22	12 58 57.93	2.3409	2 8 0.8	12.390
23	13 1 18.42	2.3421	2 20 23.9	12.378
24	13 3 38.98	2.3432	S. 2 32 46.2	12.365

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 3 38.98	2.3432	S. 2 32 46.2	12.365
1	13 5 59.60	2.3443	2 45 7.7	12.351
2	13 8 20.29	2.3453	2 57 28.3	12.335
3	13 10 41.04	2.3464	3 9 47.9	12.317
4	13 13 1.86	2.3476	3 22 6.4	12.298
5	13 15 22.76	2.3489	3 34 23.7	12.278
6	13 17 43.73	2.3501	3 46 39.8	12.257
7	13 20 4.77	2.3513	3 58 54.5	12.233
8	13 22 25.89	2.3526	4 11 7.7	12.208
9	13 24 47.08	2.3539	4 23 19.4	12.182
10	13 27 8.35	2.3552	4 35 29.5	12.154
11	13 29 29.70	2.3565	4 47 37.9	12.124
12	13 31 51.13	2.3578	4 59 44.4	12.093
13	13 34 12.64	2.3592	5 11 49.0	12.061
14	13 36 34.23	2.3605	5 23 51.7	12.027
15	13 38 55.90	2.3619	5 35 52.3	11.992
16	13 41 17.66	2.3633	5 47 50.7	11.955
17	13 43 39.50	2.3647	5 59 46.9	11.917
18	13 46 1.43	2.3662	6 11 40.7	11.877
19	13 48 23.45	2.3677	6 23 32.1	11.836
20	13 50 45.55	2.3691	6 35 21.0	11.793
21	13 53 7.74	2.3706	6 47 7.2	11.748
22	13 55 30.02	2.3721	6 58 50.7	11.702
23	13 57 52.39	2.3735	S. 7 10 31.5	11.656

FRIDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 0 14.84	2.3750	S. 7 22 9.4	11.607
1	14 2 37.39	2.3766	7 33 44.3	11.557
2	14 5 0.03	2.3781	7 45 16.2	11.506
3	14 7 22.76	2.3796	7 56 45.0	11.452
4	14 9 45.58	2.3811	8 8 10.5	11.397
5	14 12 8.49	2.3826	8 19 32.7	11.342
6	14 14 31.49	2.3841	8 30 51.6	11.286
7	14 16 54.58	2.3857	8 42 7.0	11.227
8	14 19 17.77	2.3872	8 53 18.8	11.166
9	14 21 41.05	2.3887	9 4 26.9	11.105
10	14 24 4.42	2.3902	9 15 31.4	11.043
11	14 26 27.88	2.3918	9 26 32.1	10.979
12	14 28 51.44	2.3934	9 37 28.9	10.913
13	14 31 15.09	2.3949	9 48 21.7	10.847
14	14 33 38.83	2.3964	9 59 10.5	10.778
15	14 36 2.66	2.3979	10 9 55.1	10.708
16	14 38 26.58	2.3994	10 20 35.5	10.637
17	14 40 50.59	2.4009	10 31 11.6	10.566
18	14 43 14.69	2.4024	10 41 43.4	10.493
19	14 45 38.88	2.4039	10 52 10.8	10.418
20	14 48 3.16	2.4054	11 2 33.6	10.342
21	14 50 27.53	2.4068	11 12 51.8	10.264
22	14 52 51.98	2.4083	11 23 5.3	10.186
23	14 55 16.52	2.4098	11 33 14.1	10.107
24	14 57 41.15	2.4112	S. 11 43 18.1	10.026

SATURDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 57 41.15	2.4112	S. 11 43 18.1	10.026
1	15 0 5.86	2.4125	11 53 17.2	9.943
2	15 2 30.65	2.4139	12 3 11.3	9.860
3	15 4 55.53	2.4153	12 13 0.4	9.776
4	15 7 20.49	2.4166	12 22 44.4	9.690
5	15 9 45.52	2.4179	12 32 23.2	9.603
6	15 12 10.63	2.4192	12 41 56.8	9.516
7	15 14 35.82	2.4204	12 51 25.1	9.427
8	15 17 1.08	2.4217	13 0 48.0	9.336
9	15 19 26.42	2.4229	13 10 5.4	9.244
10	15 21 51.83	2.4241	13 19 17.3	9.152
11	15 24 17.31	2.4252	13 28 23.7	9.059
12	15 26 42.86	2.4264	13 37 24.4	8.964
13	15 29 8.48	2.4275	13 46 19.4	8.869
14	15 31 34.16	2.4285	13 55 8.7	8.772
15	15 33 59.90	2.4295	14 3 52.1	8.674
16	15 36 25.70	2.4305	14 12 29.6	8.576
17	15 38 51.56	2.4315	14 21 1.2	8.477
18	15 41 17.48	2.4324	14 29 26.9	8.377
19	15 43 43.45	2.4332	14 37 46.5	8.276
20	15 46 9.47	2.4341	14 46 0.0	8.173
21	15 48 35.54	2.4349	14 54 7.3	8.070
22	15 51 1.66	2.4357	15 2 8.4	7.967
23	15 53 27.83	2.4365	S. 15 10 3.3	7.862

SUNDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 55 54.04	2.4371	S. 15 17 51.8	7.756
1	15 58 20.28	2.4377	15 25 34.0	7.650
2	16 0 46.56	2.4383	15 33 9.8	7.542
3	16 3 12.88	2.4389	15 40 39.1	7.434
4	16 5 39.23	2.4393	15 48 1.9	7.326
5	16 8 5.60	2.4397	15 55 18.2	7.217
6	16 10 32.00	2.4401	16 2 27.9	7.107
7	16 12 58.42	2.4405	16 9 31.0	6.996
8	16 15 24.86	2.4408	16 16 27.4	6.884
9	16 17 51.32	2.4411	16 23 17.1	6.772
10	16 20 17.79	2.4413	16 30 0.1	6.660
11	16 22 44.27	2.4414	16 36 36.3	6.547
12	16 25 10.76	2.4415	16 43 5.7	6.433
13	16 27 37.25	2.4415	16 49 28.3	6.319
14	16 30 3.74	2.4415	16 55 44.0	6.203
15	16 32 30.23	2.4414	17 1 52.7	6.087
16	16 34 56.71	2.4412	17 7 54.4	5.971
17	16 37 23.18	2.4410	17 13 49.2	5.855
18	16 39 49.63	2.4408	17 19 37.0	5.738
19	16 42 16.07	2.4405	17 25 17.8	5.621
20	16 44 42.49	2.4401	17 30 51.5	5.504
21	16 47 8.88	2.4396	17 36 18.2	5.386
22	16 49 35.24	2.4391	17 41 37.8	5.267
23	16 52 1.57	2.4386	17 46 50.2	5.147
24	16 54 27.87	2.4380	S. 17 51 55.5	5.028

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 54 27.87	2.4380	S. 17 51 55.5	5.028
1	16 56 54.13	2.4373	17 56 53.6	4.909
2	16 59 20.34	2.4365	18 1 44.6	4.790
3	17 1 46.51	2.4357	18 6 28.4	4.670
4	17 4 12.63	2.4348	18 11 5.0	4.550
5	17 6 38.69	2.4339	18 15 34.4	4.429
6	17 9 4.70	2.4329	18 19 56.5	4.308
7	17 11 30.64	2.4318	18 24 11.4	4.187
8	17 13 56.52	2.4307	18 28 19.0	4.067
9	17 16 22.33	2.4295	18 32 19.4	3.946
10	17 18 48.06	2.4282	18 36 12.5	3.825
11	17 21 13.72	2.4270	18 39 58.4	3.704
12	17 23 39.30	2.4257	18 43 37.0	3.582
13	17 26 4.80	2.4242	18 47 8.3	3.461
14	17 28 30.20	2.4226	18 50 32.3	3.339
15	17 30 55.51	2.4210	18 53 49.0	3.218
16	17 33 20.72	2.4193	18 56 58.5	3.097
17	17 35 45.83	2.4177	19 0 0.7	2.976
18	17 38 10.84	2.4159	19 2 55.6	2.854
19	17 40 35.74	2.4141	19 5 43.2	2.733
20	17 43 0.53	2.4122	19 8 23.6	2.612
21	17 45 25.20	2.4102	19 10 56.7	2.491
22	17 47 49.75	2.4082	19 13 22.5	2.370
23	17 50 14.18	2.4061	S. 19 15 41.1	2.249

TUESDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 52 38.48	2.4039	S. 19 17 52.4	2.128
1	17 55 2.65	2.4017	19 19 56.5	2.008
2	17 57 26.68	2.3994	19 21 53.4	1.888
3	17 59 50.58	2.3971	19 23 43.1	1.768
4	18 2 14.34	2.3947	19 25 25.6	1.648
5	18 4 37.95	2.3922	19 27 0.9	1.529
6	18 7 1.41	2.3897	19 28 29.1	1.410
7	18 9 24.72	2.3872	19 29 50.1	1.291
8	18 11 47.88	2.3846	19 31 4.0	1.172
9	18 14 10.88	2.3819	19 32 10.8	1.054
10	18 16 33.71	2.3791	19 33 10.5	0.936
11	18 18 56.37	2.3762	19 34 3.1	0.818
12	18 21 18.86	2.3734	19 34 48.7	0.701
13	18 23 41.18	2.3705	19 35 27.2	0.584
14	18 26 3.32	2.3676	19 35 58.8	0.468
15	18 28 25.29	2.3646	19 36 23.4	0.352
16	18 30 47.07	2.3615	19 36 41.0	0.236
17	18 33 8.67	2.3584	19 36 51.7	0.121
18	18 35 30.08	2.3552	19 36 55.5	−0.006
19	18 37 51.30	2.3520	19 36 52.4	+0.108
20	18 40 12.32	2.3487	19 36 42.5	0.222
21	18 42 33.15	2.3454	19 36 25.8	0.335
22	18 44 53.77	2.3420	19 36 2.3	0.447
23	18 47 14.19	2.3386	19 35 32.1	0.560
24	18 49 34.41	2.3352	S. 19 34 55.1	0.672

WEDNESDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 49 34.41	2.3352	S. 19 34 55.1	0.672
1	18 51 54.42	2.3317	19 34 11.4	0.783
2	18 54 14.21	2.3281	19 33 21.1	0.893
3	18 56 33.79	2.3245	19 32 24.2	1.003
4	18 58 53.15	2.3209	19 31 20.7	1.113
5	19 1 12.30	2.3173	19 30 10.6	1.223
6	19 3 31.23	2.3136	19 28 53.9	1.332
7	19 5 49.93	2.3098	19 27 30.8	1.439
8	19 8 8.41	2.3061	19 26 1.2	1.546
9	19 10 26.66	2.3023	19 24 25.2	1.652
10	19 12 44.68	2.2984	19 22 42.9	1.758
11	19 15 2.47	2.2946	19 20 54.2	1.864
12	19 17 20.03	2.2907	19 18 59.2	1.969
13	19 19 37.35	2.2867	19 16 57.9	2.073
14	19 21 54.43	2.2828	19 14 50.4	2.176
15	19 24 11.28	2.2788	19 12 36.8	2.279
16	19 26 27.89	2.2747	19 10 17.0	2.381
17	19 28 44.25	2.2706	19 7 51.1	2.482
18	19 31 0.36	2.2665	19 5 19.2	2.583
19	19 33 16.23	2.2624	19 2 41.2	2.683
20	19 35 31.85	2.2583	18 59 57.2	2.782
21	19 37 47.23	2.2542	18 57 7.3	2.881
22	19 40 2.36	2.2501	18 54 11.5	2.979
23	19 42 17.24	2.2459	S. 18 51 9.9	3.076

THURSDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 44 31.86	2.2416	S. 18 48 2.4	3.173
1	19 46 46.23	2.2374	18 44 49.1	3.269
2	19 49 0.35	2.2332	18 41 30.1	3.363
3	19 51 14.21	2.2289	18 38 5.5	3.457
4	19 53 27.82	2.2247	18 34 35.2	3.551
5	19 55 41.17	2.2204	18 30 59.3	3.645
6	19 57 54.27	2.2162	18 27 17.8	3.737
7	20 0 7.11	2.2119	18 23 30.8	3.828
8	20 2 19.69	2.2076	18 19 38.4	3.918
9	20 4 32.02	2.2032	18 15 40.6	4.008
10	20 6 44.08	2.1989	18 11 37.4	4.098
11	20 8 55.89	2.1946	18 7 28.8	4.187
12	20 11 7.44	2.1903	18 3 14.9	4.275
13	20 13 18.73	2.1860	17 58 55.8	4.362
14	20 15 29.76	2.1816	17 54 31.5	4.447
15	20 17 40.52	2.1773	17 50 2.1	4.532
16	20 19 51.03	2.1730	17 45 27.6	4.617
17	20 22 1.28	2.1686	17 40 48.0	4.702
18	20 24 11.26	2.1642	17 36 3.3	4.786
19	20 26 20.98	2.1599	17 31 13.7	4.868
20	20 28 30.45	2.1556	17 26 19.2	4.949
21	20 30 39.66	2.1513	17 21 19.8	5.030
22	20 32 48.61	2.1470	17 16 15.6	5.110
23	20 34 57.30	2.1427	17 11 6.6	5.190
24	20 37 5.73	2.1384	S. 17 5 52.8	5.269

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 13.					**SUNDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 37 5.73	2.1384	S. 17 5 52.8	5.269	0	22 15 9.11	1.9580	S. 11 36 4.1	8.206
1	20 39 13.90	2.1341	17 0 34.3	5.347	1	22 17 6.50	1.9551	11 27 50.4	8.250
2	20 41 21.82	2.1298	16 55 11.2	5.424	2	22 19 3.72	1.9522	11 19 34.1	8.294
3	20 43 29.48	2.1256	16 49 43.5	5.500	3	22 21 0.76	1.9493	11 11 15.1	8.338
4	20 45 36.89	2.1213	16 44 11.2	5.576	4	22 22 57.63	1.9464	11 2 53.5	8.381
5	20 47 44.04	2.1171	16 38 34.4	5.652	5	22 24 54.33	1.9436	10 54 29.4	8.423
6	20 49 50.94	2.1128	16 32 53.0	5.726	6	22 26 50.87	1.9409	10 46 2.7	8.465
7	20 51 57.58	2.1086	16 27 7.2	5.799	7	22 28 47.24	1.9382	10 37 33.6	8.506
8	20 54 3.97	2.1044	16 21 17.1	5.872	8	22 30 43.45	1.9356	10 29 2.0	8.547
9	20 56 10.11	2.1002	16 15 22.6	5.944	9	22 32 39.51	1.9330	10 20 28.0	8.587
10	20 58 16.00	2.0961	16 9 23.8	6.015	10	22 34 35.41	1.9303	10 11 51.6	8.626
11	21 0 21.64	2.0920	16 3 20.8	6.086	11	22 36 31.15	1.9277	10 3 12.9	8.664
12	21 2 27.04	2.0879	15 57 13.5	6.156	12	22 38 26.74	1.9252	9 54 31.9	8.702
13	21 4 32.19	2.0837	15 51 2.1	6.224	13	22 40 22.18	1.9228	9 45 48.6	8.740
14	21 6 37.09	2.0797	15 44 46.6	6.293	14	22 42 17.48	1.9205	9 37 3.1	8.777
15	21 8 41.75	2.0757	15 38 27.0	6.361	15	22 44 12.64	1.9182	9 28 15.4	8.813
16	21 10 46.17	2.0716	15 32 3.3	6.428	16	22 46 7.66	1.9158	9 19 25.6	8.849
17	21 12 50.34	2.0675	15 25 35.6	6.495	17	22 48 2.54	1.9135	9 10 33.6	8.884
18	21 14 54.27	2.0635	15 19 3.9	6.561	18	22 49 57.28	1.9112	9 1 39.5	8.918
19	21 16 57.96	2.0596	15 12 28.3	6.625	19	22 51 51.89	1.9091	8 52 43.4	8.952
20	21 19 1.42	2.0557	15 5 48.9	6.688	20	22 53 46.37	1.9070	8 43 45.3	8.986
21	21 21 4.64	2.0517	14 59 5.7	6.751	21	22 55 40.73	1.9049	8 34 45.1	9.019
22	21 23 7.63	2.0478	14 52 18.7	6.814	22	22 57 34.96	1.9028	8 25 43.0	9.051
23	21 25 10.38	2.0439	S. 14 45 28.0	6.877	23	22 59 29.07	1.9008	S. 8 16 39.0	9.083
	SATURDAY 14.					**MONDAY 16.**			
0	21 27 12.90	2.0401	S. 14 38 33.5	6.938	0	23 1 23.06	1.8989	S. 8 7 33.1	9.114
1	21 29 15.19	2.0363	14 31 35.5	6.998	1	23 3 16.94	1.8971	7 58 25.3	9.145
2	21 31 17.26	2.0326	14 24 33.7	7.058	2	23 5 10.71	1.8952	7 49 15.7	9.174
3	21 33 19.10	2.0288	14 17 28.4	7.117	3	23 7 4.36	1.8934	7 40 4.4	9.203
4	21 35 20.72	2.0251	14 10 19.6	7.176	4	23 8 57.91	1.8916	7 30 51.3	9.232
5	21 37 22.11	2.0214	14 3 7.3	7.234	5	23 10 51.35	1.8898	7 21 36.5	9.261
6	21 39 23.28	2.0178	13 55 51.5	7.292	6	23 12 44.69	1.8882	7 12 20.0	9.289
7	21 41 24.24	2.0142	13 48 32.3	7.348	7	23 14 37.93	1.8866	7 3 1.8	9.316
8	21 43 24.98	2.0105	13 41 9.8	7.403	8	23 16 31.08	1.8851	6 53 42.1	9.342
9	21 45 25.50	2.0069	13 33 44.0	7.458	9	23 18 24.14	1.8836	6 44 20.8	9.366
10	21 47 25.81	2.0034	13 26 14.9	7.513	10	23 20 17.11	1.8821	6 34 57.9	9.394
11	21 49 25.91	2.0000	13 18 42.5	7.566	11	23 22 9.99	1.8806	6 25 33.5	9.419
12	21 51 25.81	1.9966	13 11 6.9	7.619	12	23 24 2.78	1.8792	6 16 7.6	9.443
13	21 53 25.50	1.9932	13 3 28.2	7.672	13	23 25 55.49	1.8779	6 6 40.3	9.467
14	21 55 24.99	1.9898	12 55 46.3	7.724	14	23 27 48.13	1.8766	5 57 11.6	9.491
15	21 57 24.27	1.9864	12 48 1.3	7.775	15	23 29 40.69	1.8753	5 47 41.4	9.514
16	21 59 23.35	1.9831	12 40 13.3	7.825	16	23 31 33.17	1.8742	5 38 9.9	9.536
17	22 1 22.24	1.9798	12 32 22.3	7.875	17	23 33 25.59	1.8731	5 28 37.1	9.557
18	22 3 20.93	1.9766	12 24 28.3	7.924	18	23 35 17.94	1.8720	5 19 3.0	9.578
19	22 5 19.43	1.9734	12 16 31.4	7.973	19	23 37 10.23	1.8709	5 9 27.7	9.598
20	22 7 17.74	1.9702	12 8 31.6	8.021	20	23 39 2.45	1.8698	4 59 51.2	9.618
21	22 9 15.86	1.9671	12 0 28.9	8.068	21	23 40 54.61	1.8689	4 50 13.5	9.638
22	22 11 13.79	1.9640	11 52 23.4	8.115	22	23 42 46.72	1.8681	4 40 34.6	9.658
23	22 13 11.54	1.9610	11 44 15.1	8.161	23	23 44 38.78	1.8672	4 30 54.5	9.677
24	22 15 9.11	1.9580	S. 11 36 4.1	8.206	24	23 46 30.79	1.8664	S. 4 21 13.3	9.695

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 46 30.79	1.8664	S. 4 21 13.3	9.695
1	23 48 22.75	1.8657	4 11 31.1	9.712
2	23 50 14.67	1.8650	4 1 47.9	9.728
3	23 52 6.55	1.8643	3 52 3.7	9.744
4	23 53 58.39	1.8637	3 42 18.6	9.760
5	23 55 50.20	1.8631	3 32 32.5	9.776
6	23 57 41.97	1.8626	3 22 45.5	9.790
7	23 59 33.71	1.8622	3 12 57.7	9.804
8	0 1 25.43	1.8618	3 3 9.0	9.818
9	0 3 17.13	1.8615	2 53 19.5	9.831
10	0 5 8.81	1.8612	2 43 29.3	9.843
11	0 7 0.47	1.8609	2 33 38.4	9.855
12	0 8 52.11	1.8606	2 23 46.7	9.867
13	0 10 43.74	1.8604	2 13 54.3	9.878
14	0 12 35.36	1.8603	2 4 1.3	9.888
15	0 14 26.98	1.8602	1 54 7.8	9.897
16	0 16 18.59	1.8602	1 44 13.7	9.906
17	0 18 10.21	1.8603	1 34 19.1	9.915
18	0 20 1.83	1.8604	1 24 23.9	9.923
19	0 21 53.46	1.8605	1 14 28.3	9.930
20	0 23 45.09	1.8606	1 4 32.3	9.937
21	0 25 36.73	1.8609	0 54 35.9	9.943
22	0 27 28.39	1.8612	0 44 39.1	9.950
23	0 29 20.07	1.8615	S. 0 34 41.9	9.956

WEDNESDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 31 11.77	1.8618	S. 0 24 44.4	9.960
1	0 33 3.49	1.8622	0 14 46.7	9.963
2	0 34 55.24	1.8627	S. 0 4 48.8	9.967
3	0 36 47.01	1.8632	N. 0 5 9.3	9.970
4	0 38 38.82	1.8637	0 15 7.6	9.973
5	0 40 30.66	1.8643	0 25 6.1	9.976
6	0 42 22.54	1.8650	0 35 4.7	9.977
7	0 44 14.46	1.8657	0 45 3.3	9.977
8	0 46 6.42	1.8664	0 55 1.9	9.977
9	0 47 58.43	1.8672	1 5 0.6	9.977
10	0 49 50.49	1.8681	1 14 59.2	9.976
11	0 51 42.60	1.8690	1 24 57.7	9.974
12	0 53 34.77	1.8699	1 34 56.0	9.971
13	0 55 26.99	1.8708	1 44 54.2	9.969
14	0 57 19.27	1.8719	1 54 52.2	9.966
15	0 59 11.62	1.8731	2 4 50.1	9.962
16	1 1 4.04	1.8742	2 14 47.7	9.957
17	1 2 56.52	1.8753	2 24 45.0	9.952
18	1 4 49.07	1.8765	2 34 41.9	9.946
19	1 6 41.70	1.8777	2 44 38.5	9.940
20	1 8 34.40	1.6790	2 54 34.7	9.933
21	1 10 27.18	1.8804	3 4 30.5	9.926
22	1 12 20.05	1.8818	3 14 25.8	9.917
23	1 14 13.00	1.8832	3 24 20.6	9.908
24	1 16 6.04	1.8847	N. 3 34 14.8	9.898

THURSDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 16 6.04	1.8847	N. 3 34 14.8	9.898
1	1 17 59.17	1.8862	3 44 8.4	9.888
2	1 19 52.39	1.8878	3 54 1.4	9.878
3	1 21 45.71	1.8895	4 3 53.8	9.867
4	1 23 39.13	1.8912	4 13 45.5	9.855
5	1 25 32.65	1.8929	4 23 36.4	9.843
6	1 27 26.27	1.8946	4 33 26.6	9.830
7	1 29 20.00	1.8964	4 43 16.0	9.816
8	1 31 13.84	1.8983	4 53 4.5	9.801
9	1 33 7.79	1.9002	5 2 52.1	9.786
10	1 35 1.86	1.9022	5 12 38.8	9.770
11	1 36 56.05	1.9041	5 22 24.5	9.754
12	1 38 50.35	1.9060	5 32 9.3	9.737
13	1 40 44.77	1.9081	5 41 53.0	9.719
14	1 42 39.32	1.9102	5 51 35.6	9.701
15	1 44 34.00	1.9124	6 1 17.1	9.682
16	1 46 28.81	1.9146	6 10 57.4	9.662
17	1 48 23.75	1.9168	6 20 36.5	9.642
18	1 50 18.82	1.9190	6 30 14.4	9.621
19	1 52 14.03	1.9213	6 39 51.0	9.599
20	1 54 9.38	1.9237	6 49 26.3	9.577
21	1 56 4.87	1.9261	6 59 0.2	9.553
22	1 58 0.51	1.9285	7 8 32.7	9.529
23	1 59 56.29	1.9309	N. 7 18 3.7	9.505

FRIDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	2 1 52.22	1.9334	N. 7 27 33.3	9.480
1	2 3 48.30	1.9360	7 37 1.3	9.454
2	2 5 44.54	1.9386	7 46 27.7	9.428
3	2 7 40.93	1.9412	7 55 52.6	9.401
4	2 9 37.48	1.9439	8 5 15.8	9.372
5	2 11 34.19	1.9466	8 14 37.3	9.343
6	2 13 31.07	1.9493	8 23 57.0	9.314
7	2 15 28.11	1.9521	8 33 15.0	9.284
8	2 17 25.32	1.9549	8 42 31.1	9.253
9	2 19 22.69	1.9577	8 51 45.3	9.221
10	2 21 20.24	1.9606	9 0 57.6	9.188
11	2 23 17.96	1.9634	9 10 7.9	9.155
12	2 25 15.85	1.9663	9 19 16.2	9.121
13	2 27 13.92	1.9693	9 28 22.4	9.087
14	2 29 12.17	1.9723	9 37 26.6	9.052
15	2 31 10.60	1.9754	9 46 28.7	9.017
16	2 33 9.22	1.9786	9 55 28.6	8.979
17	2 35 8.03	1.9817	10 4 26.2	8.941
18	2 37 7.02	1.9848	10 13 21.5	8.902
19	2 39 6.20	1.9879	10 22 14.5	8.863
20	2 41 5.57	1.9911	10 31 5.1	8.823
21	2 43 5.14	1.9944	10 39 53.3	8.782
22	2 45 4.90	1.9976	10 48 39.0	8.741
23	2 47 4.85	2.0008	10 57 22.2	8.690
24	2 49 5.00	2.0042	N.11 6 2.9	8.657

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 49 5.00	2.0042	N.11 6 2.9	8.657
1	2 51 5.35	2.0075	11 14 41.0	8.613
2	2 53 5.90	2.0109	11 23 16.4	8.568
3	2 55 6.66	2.0143	11 31 49.1	8.523
4	2 57 7.62	2.0177	11 40 19.1	8.476
5	2 59 8.79	2.0212	11 48 46.2	8.429
6	3 1 10.16	2.0246	11 57 10.5	8.381
7	3 3 11.74	2.0281	12 5 31.9	8.332
8	3 5 13.53	2.0316	12 13 50.4	8.283
9	3 7 15.53	2.0352	12 22 5.9	8.233
10	3 9 17.75	2.0387	12 30 18.4	8.182
11	3 11 20.18	2.0422	12 38 27.8	8.131
12	3 13 22.82	2.0458	12 46 34.1	8.078
13	3 15 25.68	2.0495	12 54 37.2	8.024
14	3 17 28.76	2.0532	13 2 37.0	7.970
15	3 19 32.06	2.0568	13 10 33.6	7.916
16	3 21 35.57	2.0604	13 18 26.9	7.860
17	3 23 39.31	2.0641	13 26 16.8	7.802
18	3 25 43.27	2.0678	13 34 3.2	7.744
19	3 27 47.45	2.0716	13 41 46.1	7.686
20	3 29 51.86	2.0753	13 49 25.5	7.627
21	3 31 56.49	2.0790	13 57 1.4	7.568
22	3 34 1.34	2.0828	14 4 33.7	7.507
23	3 36 6.42	2.0866	N.14 12 2.3	7.446

SUNDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	3 38 11.73	2.0904	N.14 19 27.2	7.383
1	3 40 17.27	2.0942	14 26 48.3	7.320
2	3 42 23.03	2.0979	14 34 5.6	7.256
3	3 44 29.02	2.1017	14 41 19.0	7.191
4	3 46 35.24	2.1056	14 48 28.5	7.125
5	3 48 41.69	2.1094	14 55 34.0	7.058
6	3 50 48.36	2.1131	15 2 35.5	6.991
7	3 52 55.26	2.1169	15 9 32.9	6.922
8	3 55 2.39	2.1208	15 16 26.2	6.853
9	3 57 9.75	2.1247	15 23 15.3	6.783
10	3 59 17.35	2.1286	15 30 0.2	6.713
11	4 1 25.18	2.1324	15 36 40.9	6.642
12	4 3 33.24	2.1362	15 43 17.3	6.570
13	4 5 41.53	2.1401	15 49 49.3	6.497
14	4 7 50.05	2.1439	15 56 16.9	6.422
15	4 9 58.80	2.1477	16 2 40.0	6.347
16	4 12 7.77	2.1514	16 8 58.6	6.272
17	4 14 16.97	2.1552	16 15 12.6	6.196
18	4 16 26.40	2.1591	16 21 22.1	6.119
19	4 18 36.06	2.1629	16 27 26.9	6.041
20	4 20 45.95	2.1667	16 33 27.0	5.962
21	4 22 56.06	2.1704	16 39 22.3	5.882
22	4 25 6.40	2.1742	16 45 12.8	5.802
23	4 27 16.97	2.1781	16 50 58.5	5.721
24	4 29 27.77	2.1818	N.16 56 39.3	5.639

MONDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 29 27.77	2.1818	N.16 56 39.3	5.639
1	4 31 38.79	2.1855	17 2 15.2	5.556
2	4 33 50.03	2.1892	17 7 46.0	5.472
3	4 36 1.50	2.1930	17 13 11.8	5.387
4	4 38 13.19	2.1967	17 18 32.5	5.302
5	4 40 25.10	2.2003	17 23 48.1	5.217
6	4 42 37.23	2.2040	17 28 58.5	5.130
7	4 44 49.58	2.2076	17 34 3.7	5.043
8	4 47 2.14	2.2112	17 39 3.7	4.956
9	4 49 14.92	2.2148	17 43 58.4	4.867
10	4 51 27.92	2.2184	17 48 47.7	4.776
11	4 53 41.13	2.2219	17 53 31.5	4.685
12	4 55 54.55	2.2254	17 58 9.9	4.594
13	4 58 8.18	2.2289	18 2 42.8	4.503
14	5 0 22.02	2.2324	18 7 10.2	4.411
15	5 2 36.07	2.2359	18 11 32.1	4.318
16	5 4 50.33	2.2393	18 15 48.4	4.224
17	5 7 4.79	2.2427	18 19 59.0	4.129
18	5 9 19.45	2.2460	18 24 3.8	4.033
19	5 11 34.31	2.2493	18 28 2.9	3.938
20	5 13 49.37	2.2526	18 31 56.3	3.842
21	5 16 4.62	2.2558	18 35 43.9	3.744
22	5 18 20.07	2.2591	18 39 25.6	3.646
23	5 20 35.71	2.2623	N.18 43 1.4	3.547

TUESDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	5 22 51.54	2.2654	N.18 46 31.3	3.448
1	5 25 7.56	2.2685	18 49 55.2	3.348
2	5 27 23.76	2.2716	18 53 13.1	3.248
3	5 29 40.15	2.2746	18 56 24.9	3.147
4	5 31 56.72	2.2776	18 59 30.7	3.045
5	5 34 13.46	2.2805	19 2 30.3	2.942
6	5 36 30.38	2.2835	19 5 23.8	2.840
7	5 38 47.48	2.2863	19 8 11.1	2.737
8	5 41 4.74	2.2891	19 10 52.2	2.632
9	5 43 22.17	2.2918	19 13 27.0	2.528
10	5 45 39.76	2.2946	19 15 55.6	2.423
11	5 47 57.52	2.2973	19 18 17.8	2.318
12	5 50 15.44	2.2999	19 20 33.7	2.212
13	5 52 33.51	2.3025	19 22 43.2	2.105
14	5 54 51.74	2.3051	19 24 46.3	1.997
15	5 57 10.12	2.3076	19 26 42.9	1.890
16	5 59 28.65	2.3100	19 28 33.1	1.782
17	6 1 47.32	2.3123	19 30 16.8	1.674
18	6 4 6.13	2.3146	19 31 54.0	1.565
19	6 6 25.08	2.3169	19 33 24.6	1.456
20	6 8 44.16	2.3192	19 34 48.7	1.347
21	6 11 3.38	2.3214	19 36 6.2	1.236
22	6 13 22.73	2.3235	19 37 17.0	1.125
23	6 15 42.20	2.3256	19 38 21.2	1.015
24	6 18 1.80	2.3277	N.19 39 18.8	0.904

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 18 1.80	2.3277	N.19 39 18.8	0.904
1	6 20 21.52	2.3296	19 40 9.7	0.793
2	6 22 41.35	2.3314	19 40 53.9	0.681
3	6 25 1.29	2.3333	19 41 31.4	0.568
4	6 27 21.35	2.3351	19 42 2.1	0.456
5	6 29 41.51	2.3368	19 42 26.1	0.343
6	6 32 1.77	2.3385	19 42 43.3	0.230
7	6 34 22.13	2.3402	19 42 53.7	0.117
8	6 36 42.59	2.3117	19 42 57.3	+0.003
9	6 39 3.14	2.3432	19 42 54.1	−0.110
10	6 41 23.78	2.3447	19 42 44.1	0.224
11	6 43 44.50	2.3460	19 42 27.2	0.338
12	6 46 5.30	2.3473	19 42 3.5	0.452
13	6 48 26.18	2.3486	19 41 32.9	0.567
14	6 50 47.14	2.3499	19 40 55.4	0.682
15	6 53 8.17	2.3511	19 40 11.1	0.796
16	6 55 29.27	2.3522	19 39 19.9	0.911
17	6 57 50.43	2.3532	19 38 21.8	1.026
18	7 0 11.66	2.3542	19 37 16.8	1.141
19	7 2 32.94	2.3551	19 36 4.9	1.257
20	7 4 54.27	2.3560	19 34 46.0	1.372
21	7 7 15.66	2.3568	19 33 20.2	1.487
22	7 9 37.09	2.3576	19 31 47.5	1.602
23	7 11 58.57	2.3583	N.19 30 7.9	1.717

THURSDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 14 20.09	2.3589	N.19 28 21.4	1.832
1	7 16 41.64	2.3595	19 26 28.0	1.948
2	7 19 3.23	2.3601	19 24 27.6	2.064
3	7 21 24.85	2.3605	19 22 20.3	2.179
4	7 23 46.49	2.3609	19 20 6.1	2.294
5	7 26 8.16	2.3613	19 17 45.0	2.409
6	7 28 29.85	2.3616	19 15 17.0	2.524
7	7 30 51.55	2.3618	19 12 42.1	2.639
8	7 33 13.26	2.3620	19 10 0.3	2.754
9	7 35 34.99	2.3622	19 7 11.6	2.868
10	7 37 56.72	2.3623	19 4 16.1	2.983
11	7 40 18.46	2.3623	19 1 13.7	3.098
12	7 42 40.20	2.3622	18 58 4.4	3.212
13	7 45 1.93	2.3622	18 54 48.3	3.325
14	7 47 23.66	2.3621	18 51 25.4	3.439
15	7 49 45.38	2.3619	18 47 55.6	3.553
16	7 52 7.09	2.3617	18 44 19.0	3.666
17	7 54 28.78	2.3614	18 40 35.7	3.778
18	7 56 50.46	2.3611	18 36 45.7	3.890
19	7 59 12.11	2.3607	18 32 48.9	4.002
20	8 1 33.74	2.3603	18 28 45.4	4.115
21	8 3 55.35	2.3599	18 24 35.1	4.227
22	8 6 16.93	2.3593	18 20 18.1	4.338
23	8 8 38.47	2.3587	18 15 54.5	4.449
24	8 10 59.98	2.3581	N.18 11 24.2	4.560

FRIDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 10 59.98	2.3581	N.18 11 24.2	4.560
1	8 13 21.45	2.3575	18 6 47.3	4.670
2	8 15 42.88	2.3568	18 2 3.8	4.780
3	8 18 4.27	2.3561	17 57 13.7	4.890
4	8 20 25.62	2.3554	17 52 17.0	4.999
5	8 22 46.92	2.3546	17 47 13.8	5.108
6	8 25 8.17	2.3537	17 42 4.1	5.216
7	8 27 29.37	2.3529	17 36 47.9	5.324
8	8 29 50.52	2.3520	17 31 25.3	5.431
9	8 32 11.61	2.3510	17 25 56.2	5.537
10	8 34 32.64	2.3500	17 20 20.8	5.643
11	8 36 53.61	2.3491	17 14 39.0	5.749
12	8 39 14.53	2.3481	17 8 50.9	5.854
13	8 41 35.38	2.3469	17 2 56.5	5.959
14	8 43 56.16	2.3458	16 56 55.8	6.063
15	8 46 16.88	2.3447	16 50 48.9	6.167
16	8 48 37.53	2.3436	16 44 35.8	6.270
17	8 50 58.11	2.3424	16 38 16.5	6.372
18	8 53 18.61	2.3411	16 31 51.1	6.474
19	8 55 39.04	2.3399	16 25 19.6	6.575
20	8 57 59.40	2.3387	16 18 42.1	6.676
21	9 0 19.68	2.3374	16 11 58.5	6.776
22	9 2 39.88	2.3360	16 5 9.0	6.875
23	9 5 0.00	2.3347	N.15 58 13.5	6.974

SATURDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 7 20.05	2.3334	N.15 51 12.1	7.072
1	9 9 40.01	2.3320	15 44 4.8	7.170
2	9 11 59.89	2.3307	15 36 51.7	7.266
3	9 14 19.69	2.3293	15 29 32.9	7.362
4	9 16 39.40	2.3279	15 22 8.3	7.457
5	9 18 59.03	2.3265	15 14 38.0	7.552
6	9 21 18.58	2.3251	15 7 2.1	7.645
7	9 23 38.04	2.3236	14 59 20.6	7.738
8	9 25 57.41	2.3221	14 51 33.5	7.831
9	9 28 16.69	2.3206	14 43 40.9	7.922
10	9 30 35.88	2.3192	14 35 42.8	8.013
11	9 32 54.99	2.3177	14 27 39.3	8.102
12	9 35 14.01	2.3162	14 19 30.5	8.191
13	9 37 32.94	2.3147	14 11 16.4	8.279
14	9 39 51.78	2.3132	14 2 57.0	8.367
15	9 42 10.53	2.3117	13 54 32.3	8.455
16	9 44 29.19	2.3102	13 46 2.4	8.541
17	9 46 47.76	2.3087	13 37 27.4	8.626
18	9 49 6.24	2.3072	13 28 47.3	8.710
19	9 51 24.63	2.3057	13 20 2.2	8.793
20	9 53 42.93	2.3042	13 11 12.1	8.876
21	9 56 1.14	2.3028	13 2 17.1	8.957
22	9 58 19.27	2.3014	12 53 17.2	9.038
23	10 0 37.31	2.2999	12 44 12.5	9.118
24	10 2 55.26	2.2984	N.12 35 3.1	9.197

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 2 55.26	2.2984	N.12 35 3.1	9.197
1	10 5 13.12	2.2969	12 25 48.9	9.276
2	10 7 30.89	2.2955	12 16 30.0	9.352
3	10 9 48.58	2.2941	12 7 6.6	9.428
4	10 12 6.18	2.2927	11 57 38.6	9.504
5	10 14 23.70	2.2912	11 48 6.1	9.578
6	10 16 41.13	2.2898	11 38 29.2	9.652
7	10 18 58.48	2.2884	11 28 47.9	9.725
8	10 21 15.74	2.2870	11 19 2.2	9.797
9	10 23 32.92	2.2857	11 9 12.2	9.867
10	10 25 50.02	2.2844	10 59 18.1	9.937
11	10 28 7.04	2.2831	10 49 19.8	10.006
12	10 30 23.99	2.2818	10 39 17.4	10.073
13	10 32 40.86	2.2805	10 29 11.0	10.140
14	10 34 57.65	2.2792	10 19 0.6	10.207
15	10 37 14.36	2.2779	10 8 46.2	10.272
16	10 39 31.00	2.2767	9 58 28.0	10.335
17	10 41 47.57	2.2755	9 48 6.0	10.398
18	10 44 4.06	2.2743	9 37 40.2	10.460
19	10 46 20.49	2.2732	9 27 10.8	10.520
20	10 48 36.85	2.2721	9 16 37.8	10.580
21	10 50 53.14	2.2710	9 6 1.2	10.639
22	10 53 9.37	2.2700	8 55 21.1	10.697
23	10 55 25.54	2.2689	N. 8 44 37.6	10.753

MONDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 57 41.64	2.2678	N. 8 33 50.7	10.809
1	10 59 57.68	2.2668	8 23 0.5	10.863
2	11 2 13.66	2.2659	8 12 7.1	10.917
3	11 4 29.59	2.2651	8 1 10.5	10.969
4	11 6 45.47	2.2642	7 50 10.8	11.021
5	11 9 1.29	2.2633	7 39 8.0	11.071
6	11 11 17.06	2.2624	7 28 2.3	11.119
7	11 13 32.78	2.2616	7 16 53.7	11.167
8	11 15 48.45	2.2608	7 5 42.2	11.215
9	11 18 4.08	2.2601	6 54 27.9	11.261
10	11 20 19.67	2.2595	6 43 10.9	11.306
11	11 22 35.22	2.2588	6 31 51.2	11.350
12	11 24 50.73	2.2582	6 20 28.9	11.392
13	11 27 6.20	2.2576	6 9 4.1	11.433
14	11 29 21.64	2.2570	5 57 36.9	11.473
15	11 31 37.04	2.2564	5 46 7.3	11.512
16	11 33 52.41	2.2560	5 34 35.4	11.551
17	11 36 7.76	2.2556	5 23 1.2	11.588
18	11 38 23.08	2.2552	5 11 24.8	11.624
19	11 40 38.38	2.2548	4 59 46.3	11.658
20	11 42 53.65	2.2544	4 48 5.8	11.692
21	11 45 8.90	2.2541	4 36 23.3	11.724
22	11 47 24.14	2.2539	4 24 38.9	11.756
23	11 49 39.37	2.2537	4 12 52.6	11.786
24	11 51 54.58	2.2534	N. 4 1 4.6	11.814

TUESDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 51 54.58	2.2534	N. 4 1 4.6	11.814
1	11 54 9.78	2.2533	3 49 14.9	11.842
2	11 56 24.98	2.2532	3 37 23.6	11.868
3	11 58 40.17	2.2532	3 25 30.7	11.894
4	12 0 55.36	2.2532	3 13 36.3	11.918
5	12 3 10.55	2.2532	3 1 40.5	11.941
6	12 5 25.75	2.2533	2 49 43.4	11.962
7	12 7 40.95	2.2534	2 37 45.1	11.982
8	12 9 56.16	2.2535	2 25 45.5	12.002
9	12 12 11.37	2.2537	2 13 44.8	12.021
10	12 14 26.60	2.2540	2 1 43.0	12.038
11	12 16 41.85	2.2542	1 49 40.3	12.053
12	12 18 57.11	2.2545	1 37 36.7	12.068
13	12 21 12.39	2.2549	1 25 32.2	12.081
14	12 23 27.70	2.2553	1 13 27.0	12.092
15	12 25 43.03	2.2557	1 1 21.1	12.103
16	12 27 58.38	2.2562	0 49 14.6	12.112
17	12 30 13.77	2.2567	0 37 7.6	12.121
18	12 32 29.19	2.2573	0 25 0.1	12.128
19	12 34 44.65	2.2579	0 12 52.2	12.134
20	12 37 0.14	2.2585	N. 0 0 44.0	12.138
21	12 39 15.67	2.2592	S. 0 11 24.4	12.142
22	12 41 31.24	2.2599	0 23 33.0	12.143
23	12 43 46.86	2.2607	S. 0 35 41.6	12.143

WEDNESDAY, JUNE 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 46 2.52	2.2614	S. 0 47 50.2	12.143

PHASES OF THE MOON.

		d	h	m
○ Full Moon	May	7	2	1.5
☾ Last Quarter		14	8	17.5
● New Moon		22	11	5.5
☽ First Quarter		29	17	19.6

		d	h
☾ Perigee	May	5	6.3
☾ Apogee		17	6.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Sun	W.	96° 57′ 22″	2678	98° 34′ 31″	2666	100° 11′ 57″	2652	101° 49′ 41″	2639
	Aldebaran	W.	69 33 32	2349	71 18 20	2337	73 3 26	2324	74 48 51	2312
	Venus	W.	61 59 18	2769	63 34 26	2754	65 9 54	2741	66 45 40	2726
	Saturn	W.	30 23 22	2396	32 7 2	2381	33 51 4	2367	35 35 26	2353
	Pollux	W.	27 1 23	2634	28 39 32	2590	30 18 40	2553	31 58 39	2520
	Spica	E.	64 32 11	2382	62 48 10	2371	61 3 53	2359	59 19 19	2348
	Jupiter	E.	72 1 25	2317	70 15 51	2306	68 30 0	2294	66 43 51	2281
2	Sun	W.	110 2 42	2576	111 42 10	2564	113 21 54	2553	115 1 53	2543
	Aldebaran	W.	83 40 18	2252	85 27 28	2241	87 14 55	2229	89 2 39	2218
	Venus	W.	74 49 11	2657	76 26 48	2645	78 4 42	2632	79 42 54	2620
	Saturn	W.	44 22 10	2288	46 8 27	2276	47 55 2	2264	49 41 55	2252
	Pollux	W.	40 29 5	2389	42 12 55	2368	43 57 15	2349	45 42 3	2331
	Spica	E.	50 32 40	2298	48 46 37	2289	47 0 21	2280	45 13 52	2272
	Jupiter	E.	57 48 45	2224	56 0 53	2213	54 12 45	2202	52 24 20	2192
	Antares	E.	96 25 53	2312	94 40 11	2300	92 54 12	2289	91 7 56	2278
3	Sun	W.	123 25 35	2491	125 7 1	2482	126 48 40	2474	128 30 30	2465
	Venus	W.	87 57 55	2564	89 37 40	2553	91 17 40	2543	92 57 54	2533
	Saturn	W.	58 40 29	2199	60 28 58	2189	62 17 42	2180	64 6 40	2171
	Pollux	W.	54 32 10	2254	56 19 17	2241	58 6 43	2229	59 54 27	2217
	Regulus	W.	17 56 42	2167	19 45 59	2158	21 35 30	2149	23 25 15	2140
	Spica	E.	36 18 59	2246	34 31 40	2245	32 44 19	2245	30 56 58	2247
	Jupiter	E.	43 18 32	2145	41 28 41	2137	39 38 38	2129	37 48 23	2122
	Antares	E.	82 12 42	2228	80 24 56	2219	78 36 57	2211	76 48 46	2203
4	Saturn	W.	73 14 34	2134	75 4 41	2128	76 54 57	2122	78 45 22	2118
	Pollux	W.	68 57 5	2170	70 46 17	2163	72 35 40	2157	74 25 13	2151
	Regulus	W.	32 37 2	2103	34 27 56	2098	36 18 58	2093	38 10 8	2088
	Antares	E.	67 45 16	2174	65 56 10	2170	64 6 58	2167	62 17 41	2165
5	Saturn	W.	87 59 0	2101	89 49 57	2101	91 40 55	2100	93 31 54	2100
	Regulus	W.	47 27 35	2072	49 19 17	2071	51 11 1	2070	53 2 46	2070
	Antares	E.	53 10 53	2168	51 21 37	2171	49 32 26	2176	47 43 23	2182
6	Regulus	W.	62 21 15	2079	64 12 46	2083	66 4 12	2087	67 55 31	2092
	Antares	E.	38 41 18	2241	36 53 51	2259	35 6 51	2279	33 20 21	2304
	α Aquilæ	E.	87 25 43	2588	85 46 31	2594	84 7 28	2602	82 28 36	2612
7	Regulus	W.	77 9 51	2126	79 0 10	2136	80 50 15	2145	82 40 6	2155
	Spica	W.	24 9 37	2278	25 56 9	2268	27 42 56	2262	29 29 52	2260
	Jupiter	W.	16 44 58	2162	18 34 23	2158	20 23 54	2158	22 13 25	2161
	α Aquilæ	E.	74 18 15	2686	72 41 16	2705	71 4 43	2727	69 28 39	2751
8	Regulus	W.	91 45 20	2212	93 33 29	2225	95 21 19	2239	97 8 49	2253
	Spica	W.	38 24 17	2279	40 10 48	2287	41 57 7	2296	43 43 12	2307
	Jupiter	W.	31 19 0	2200	33 7 28	2210	34 55 40	2223	36 43 34	2235
	α Aquilæ	E.	61 37 13	2906	60 5 2	2945	58 33 40	2987	57 3 11	3032
	Fomalhaut	E.	93 50 46	2492	92 9 22	2504	90 28 15	2518	88 47 27	2532
9	Spica	W.	52 29 29	2369	54 13 48	2384	55 57 46	2398	57 41 23	2413
	Jupiter	W.	45 38 13	2304	47 24 6	2320	49 9 36	2336	50 54 43	2352

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}.	P. L. of Diff.	XVIII^{h}.	P. L. of Diff.	XXI^{h}.	P. L. of Diff.
1	Sun	W.	103° 27′ 43″	2626	105° 6′ 2″	2614	106° 44′ 38″	2601	108° 23′ 31″	2588
	Aldebaran	W.	76 34 33	2300	78 20 33	2288	80 6 50	2276	81 53 25	2264
	Venus	W.	68 21 45	2712	69 58 9	2698	71 34 51	2684	73 11 52	2671
	Saturn	W.	37 20 8	2339	39 5 10	2326	40 50 31	2313	42 36 11	2300
	Pollux	W.	33 39 25	2489	35 20 54	2461	37 3 2	2435	38 45 47	2412
	Spica	E.	57 34 30	2337	55 49 25	2327	54 4 5	2317	52 18 30	2307
	Jupiter	E.	64 57 24	2270	63 10 40	2258	61 23 39	2247	59 36 21	2235
2	Sun	W.	116 42 7	2531	118 22 37	2520	120 3 22	2510	121 44 22	2500
	Aldebaran	W.	90 50 39	2208	92 38 55	2197	94 27 27	2186	96 16 15	2176
	Venus	W.	81 21 22	2606	83 0 6	2596	84 39 7	2584	86 18 24	2574
	Saturn	W.	51 29 5	2241	53 16 32	2230	55 4 15	2219	56 52 14	2208
	Pollux	W.	47 27 17	2314	49 12 56	2298	50 58 58	2283	52 45 23	2268
	Spica	E.	43 27 12	2265	41 40 21	2259	39 53 21	2253	38 6 13	2249
	Jupiter	E.	50 35 40	2181	48 46 44	2172	46 57 34	2163	45 8 10	2153
	Antares	E.	89 21 24	2267	87 34 36	2257	85 47 33	2247	84 0 15	2237
3	Sun	W.	130 12 32	2458	131 54 44	2452	133 37 5	2445	135 19 35	2440
	Venus	W.	94 38 21	2525	96 19 0	2516	97 59 51	2509	99 40 52	2502
	Saturn	W.	65 55 51	2163	67 45 14	2155	69 34 49	2147	71 24 36	2140
	Pollux	W.	61 42 29	2206	63 30 47	2196	65 19 20	2188	67 8 6	2179
	Regulus	W.	25 15 13	2132	27 5 23	2124	28 55 45	2117	30 46 18	2110
	Spica	E.	29 9 41	2252	27 22 31	2260	25 35 32	2272	23 48 51	2289
	Jupiter	E.	35 57 57	2116	34 7 22	2110	32 16 38	2105	30 25 46	2100
	Antares	E.	75 0 23	2196	73 11 50	2190	71 23 7	2184	69 34 15	2179
4	Saturn	W.	80 35 54	2114	82 26 32	2110	84 17 16	2106	86 8 6	2103
	Pollux	W.	76 14 55	2145	78 4 45	2141	79 54 42	2137	81 44 45	2134
	Regulus	W.	40 1 26	2083	41 52 51	2080	43 44 21	2077	45 35 56	2074
	Antares	E.	60 28 21	2164	58 38 59	2163	56 49 36	2163	55 0 13	2165
5	Saturn	W.	95 22 53	2101	97 13 51	2102	99 4 47	2103	100 55 41	2106
	Regulus	W.	54 54 31	2070	56 46 16	2072	58 37 59	2073	60 29 39	2076
	Antares	E.	45 54 29	2190	44 5 47	2200	42 17 20	2211	40 29 9	2224
6	Regulus	W.	69 46 42	2098	71 37 45	2104	73 28 38	2111	75 19 20	2118
	Antares	E.	31 34 27	2333	29 49 16	2368	28 4 55	2409	26 21 33	2458
	α Aquilæ	E.	80 49 57	2623	79 11 33	2635	77 33 26	2650	75 55 39	2667
7	Regulus	W.	84 29 42	2165	86 19 2	2176	88 8 6	2188	89 56 52	2200
	Spica	W.	31 16 51	2260	33 3 50	2262	34 50 46	2266	36 37 36	2272
	Jupiter	W.	24 2 52	2166	25 52 11	2172	27 41 20	2180	29 30 17	2190
	α Aquilæ	E.	67 53 7	2778	66 18 10	2806	64 43 50	2837	63 10 10	2870
8	Regulus	W.	98 55 58	2267	100 42 46	2282	102 29 12	2297	104 15 16	2312
	Spica	W.	45 29 2	2317	47 14 36	2330	48 59 52	2342	50 44 50	2355
	Jupiter	W.	38 31 10	2248	40 18 26	2262	42 5 22	2275	43 51 58	2289
	α Aquilæ	E.	55 33 38	3081	54 5 5	3133	52 37 35	3189	51 11 13	3251
	Fomalhaut	E.	87 6 58	2547	85 26 50	2564	83 47 5	2580	82 7 43	2598
9	Spica	W.	59 24 39	2429	61 7 32	2445	62 50 3	2461	64 32 11	2477
	Jupiter	W.	52 39 27	2368	54 23 47	2385	56 7 43	2401	57 51 16	2418

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
9	α Aquilæ	E.	49° 46′ 4″	3317	48° 22′ 12″	3389	46° 59′ 43″	3467	45° 38′ 42″	3553
	Fomalhaut	E.	80 28 45	2616	78 50 12	2636	77 12 6	2657	75 34 28	2678
10	Spica	W.	66 13 56	2494	67 55 18	2511	69 36 16	2528	71 16 50	2545
	Jupiter	W.	59 34 25	2435	61 17 10	2453	62 59 30	2470	64 41 26	2487
	Antares	W.	21 51 12	2897	23 23 35	2859	24 56 47	2831	26 30 34	2812
	Fomalhaut	E.	67 33 44	2796	65 59 11	2823	64 25 13	2850	62 51 50	2879
	α Pegasi	E.	82 38 38	2789	81 3 56	2810	79 29 41	2832	77 55 55	2854
11	Spica	W.	79 33 46	2632	81 11 58	2649	82 49 47	2666	84 27 13	2683
	Jupiter	W.	73 4 58	2574	74 44 28	2592	76 23 34	2609	78 2 17	2626
	Antares	W.	34 23 28	2787	35 58 13	2791	37 32 53	2796	39 7 26	2802
	Fomalhaut	E.	55 14 29	3039	53 45 4	3074	52 16 23	3112	50 48 28	3153
	α Pegasi	E.	70 14 20	2973	68 43 34	2999	67 13 20	3026	65 43 39	3052
	Sun	E.	128 40 42	2962	127 9 42	2980	125 39 4	2998	124 8 49	3016
12	Jupiter	W.	86 10 8	2709	87 46 36	2725	89 22 43	2741	90 58 29	2756
	Antares	W.	46 57 38	2848	48 31 3	2859	50 4 14	2871	51 37 10	2883
	Fomalhaut	E.	43 41 42	3388	42 19 12	3445	40 57 46	3506	39 37 29	3573
	α Pegasi	E.	58 23 56	3203	56 57 50	3236	55 32 23	3270	54 7 37	3306
	Sun	E.	116 43 0	3102	115 14 53	3119	113 47 7	3137	112 19 42	3153
13	Antares	W.	59 18 13	2939	60 49 42	2950	62 20 57	2961	63 51 59	2971
	α Pegasi	E.	47 14 48	3515	45 54 40	3563	44 35 25	3615	43 17 7	3671
	α Arietis	E.	88 36 20	3005	87 6 14	3020	85 36 26	3034	84 6 55	3047
	Sun	E.	105 7 23	3231	103 41 50	3244	102 16 33	3258	100 51 32	3272
14	Antares	W.	71 23 51	3022	72 53 36	3031	74 23 10	3040	75 52 33	3048
	α Arietis	E.	76 43 25	3112	75 15 30	3124	73 47 50	3137	72 20 25	3149
	Sun	E.	93 50 21	3334	92 26 49	3345	91 3 30	3356	89 40 23	3365
15	Antares	W.	83 17 1	3086	84 45 28	3091	86 13 48	3098	87 42 0	3103
	α Aquilæ	W.	42 21 59	4327	43 28 27	4263	44 35 54	4204	45 44 16	4153
	α Arietis	E.	65 6 54	3207	63 40 53	3218	62 15 5	3229	60 49 30	3241
	Sun	E.	82 47 29	3409	81 25 23	3416	80 3 25	3423	78 41 35	3430
16	Antares	W.	95 1 31	3125	96 29 10	3128	97 56 46	3131	99 24 18	3133
	α Aquilæ	W.	51 37 19	3949	52 49 49	3919	54 2 50	3890	55 16 20	3862
	α Arietis	E.	53 44 58	3298	52 20 44	3311	50 56 45	3324	49 33 1	3337
	Sun	E.	71 54 0	3454	70 32 44	3457	69 11 32	3460	67 50 23	3463
17	α Aquilæ	W.	61 30 11	3752	62 46 3	3733	64 2 15	3716	65 18 45	3699
	α Arietis	E.	42 38 27	3417	41 16 30	3437	39 54 55	3458	38 33 44	3483
	Sun	E.	61 5 10	3469	59 44 11	3468	58 23 11	3468	57 2 11	3467
18	α Aquilæ	W.	71 45 22	3628	73 3 26	3616	74 21 43	3604	75 40 13	3592
	Fomalhaut	W.	38 5 9	3856	39 19 14	3802	40 34 14	3754	41 50 4	3710
	Sun	E.	50 16 47	3457	48 55 35	3454	47 34 20	3452	46 13 2	3448
19	α Aquilæ	W.	82 15 44	3541	83 35 28	3532	84 55 12	3524	86 15 10	3515
	Fomalhaut	W.	48 19 48	3535	49 39 34	3506	50 59 52	3480	52 20 39	3454
	α Pegasi	W.	35 29 52	4116	36 39 38	4036	37 50 42	3963	39 2 58	3896

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
9	α Aquilæ	E.	44° 19′ 16″	3646	43° 1′ 31″	3747	41° 45′ 34″	3859	40° 31′ 33″	3982
	Fomalhaut	E.	73 57 19	2700	72 20 39	2722	70 44 29	2746	69 8 50	2771
10	Spica	W.	72 57 1	2582	74 36 48	2580	76 16 11	2597	77 55 10	2614
	JUPITER	W.	66 22 57	2504	68 4 4	2522	69 44 46	2540	71 25 4	2557
	Antares	W.	28 4 46	2798	29 39 16	2791	31 13 56	2787	32 48 41	2785
	Fomalhaut	E.	61 19 4	2908	59 46 55	2939	58 15 25	2971	56 44 36	3005
	α Pegasi	E.	76 22 37	2876	74 49 48	2899	73 17 28	2923	71 45 38	2948
11	Spica	W.	86 4 16	2700	87 40 56	2717	89 17 13	2734	90 53 8	2750
	JUPITER	W.	79 40 36	2643	81 18 32	2660	82 56 6	2676	84 33 18	2692
	Antares	W.	40 41 51	2810	42 16 6	2819	43 50 9	2828	45 24 0	2838
	Fomalhaut	E.	49 21 22	3194	47 55 6	3238	46 29 42	3285	45 5 13	3335
	α Pegasi	E.	64 14 31	3081	62 45 58	3110	61 18 1	3140	59 50 40	3171
	SUN	E.	122 38 56	3034	121 9 25	3051	119 40 15	3069	118 11 27	3086
12	JUPITER	W.	92 33 54	2772	94 8 59	2786	95 43 45	2801	97 18 12	2815
	Antares	W.	53 9 51	2894	54 42 18	2905	56 14 31	2916	57 46 29	2927
	Fomalhaut	E.	38 18 25	3645	37 0 39	3724	35 44 17	3811	34 29 26	3907
	α Pegasi	E.	52 43 33	3344	51 20 12	3383	49 57 36	3424	48 35 47	3469
	SUN	E.	110 52 37	3169	109 25 51	3184	107 59 23	3200	106 33 14	3215
13	Antares	W.	65 22 48	2982	66 53 23	2993	68 23 45	3003	69 53 54	3013
	α Pegasi	E.	41 59 49	3731	40 43 35	3795	39 28 28	3866	38 14 34	3943
	α Arietis	E.	82 37 41	3060	81 8 43	3073	79 40 1	3087	78 11 35	3100
	SUN	E.	99 26 48	3285	98 2 19	3299	96 38 6	3311	95 14 7	3322
14	Antares	W.	77 21 46	3056	78 50 49	3065	80 19 42	3072	81 48 26	3079
	α Arietis	E.	70 53 15	3161	69 26 19	3173	67 59 37	3184	66 33 9	3195
	SUN	E.	88 17 27	3375	86 54 42	3385	85 32 8	3393	84 9 44	3401
15	Antares	W.	89 10 6	3108	90 38 6	3113	92 6 0	3118	93 33 48	3122
	α Aquilæ	W.	46 53 27	4105	48 3 24	4061	49 14 4	4021	50 25 23	3983
	α Arietis	E.	59 24 9	3252	57 59 1	3264	56 34 7	3275	55 9 26	3286
	SUN	E.	77 19 52	3435	75 58 15	3441	74 36 45	3446	73 15 20	3450
16	Antares	W.	100 51 47	3135	102 19 14	3138	103 46 38	3139	105 14 0	3140
	α Aquilæ	W.	56 30 18	3837	57 44 42	3814	58 59 30	3792	60 14 40	3772
	α Arietis	E.	48 9 32	3351	46 46 19	3365	45 23 23	3381	44 0 45	3399
	SUN	E.	66 29 17	3464	65 8 13	3466	63 47 11	3467	62 26 10	3468
17	α Aquilæ	W.	66 35 33	3684	67 52 37	3669	69 9 57	3655	70 27 32	3641
	α Arietis	E.	37 13 1	3510	35 52 48	3541	34 33 9	3575	33 14 7	3613
	SUN	E.	55 41 10	3466	54 20 8	3464	52 59 4	3462	51 37 57	3459
18	α Aquilæ	W.	76 58 56	3581	78 17 51	3570	79 36 58	3560	80 56 16	3551
	Fomalhaut	W.	43 6 40	3670	44 23 59	3633	45 41 58	3598	47 0 35	3565
	SUN	E.	44 51 40	3445	43 30 14	3441	42 8 44	3437	40 47 9	3433
19	α Aquilæ	W.	87 35 18	3506	88 55 35	3499	90 16 0	3493	91 36 32	3487
	Fomalhaut	W.	53 41 55	3430	55 3 38	3408	56 25 46	3486	57 48 19	3365
	α Pegasi	W.	40 16 22	3835	41 30 48	3780	42 46 11	3728	44 2 28	3681

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
19	Sun	E.	39° 25′ 30″	3430	38° 3′ 47″	3425	36° 41′ 59″	3421	35° 20′ 6″	3417
20	Fomalhaut	W.	59 11 16	3345	60 34 36	3325	61 58 18	3307	63 22 21	3290
	α Pegasi	W.	45 19 35	3638	46 37 28	3598	47 56 5	3559	49 15 24	3524
	Sun	E.	28 29 43	3403	27 7 30	3401	25 45 15	3402	24 23 1	3404
24	Sun	W.	18 43 50	3165	20 10 41	3134	21 38 9	3108	23 6 9	3085
	Saturn	E.	28 32 40	2735	26 56 46	2729	25 20 44	2723	23 44 35	2719
	Regulus	E.	67 11 2	2678	65 33 52	2668	63 56 29	2659	62 18 54	2650
25	Sun	W.	30 32 21	2997	32 2 38	2983	33 33 12	2969	35 4 3	2956
	Regulus	E.	54 8 0	2607	52 29 14	2598	50 50 16	2589	49 11 6	2580
	Spica	E.	107 49 36	2636	106 11 30	2627	104 33 12	2618	102 54 41	2609
26	Sun	W.	42 42 15	2898	44 14 37	2887	45 47 13	2876	47 20 2	2866
	Regulus	E.	40 52 20	2538	39 12 0	2530	37 31 29	2522	35 50 47	2514
	Spica	E.	94 39 8	2566	92 59 26	2558	91 19 33	2550	89 39 29	2541
	Jupiter	E.	99 39 14	2520	97 58 28	2512	96 17 31	2504	94 36 23	2495
27	Sun	W.	55 7 23	2817	56 41 29	2808	58 15 47	2798	59 50 17	2788
	Spica	E.	81 16 19	2502	79 35 8	2494	77 53 47	2487	76 12 16	2480
	Jupiter	E.	86 7 53	2456	84 25 38	2448	82 43 12	2441	81 0 35	2433
28	Sun	W.	67 45 47	2744	69 21 28	2736	70 57 20	2728	72 33 23	2719
	Venus	W.	27 30 44	2870	29 3 41	2854	30 36 59	2839	32 10 36	2825
	Saturn	W.	24 44 34	2473	26 26 25	2462	28 8 32	2451	29 50 54	2441
	Pollux	W.	24 0 12	2753	25 35 41	2704	27 12 15	2663	28 49 44	2629
	Spica	E.	67 42 5	2444	65 59 33	2438	64 16 52	2431	62 34 1	2424
	Jupiter	E.	72 24 49	2396	70 41 8	2389	68 57 17	2381	67 13 15	2374
29	Sun	W.	80 36 28	2678	82 13 37	2670	83 50 57	2662	85 28 28	2655
	Venus	W.	40 3 0	2764	41 38 15	2753	43 13 45	2743	44 49 28	2733
	Saturn	W.	38 26 0	2398	40 9 38	2390	41 53 27	2382	43 37 28	2374
	Pollux	W.	37 7 23	2504	38 48 31	2485	40 30 5	2469	42 12 2	2453
	Spica	E.	53 57 34	2395	52 13 52	2390	50 30 3	2385	48 46 7	2380
	Jupiter	E.	58 30 32	2339	56 45 29	2333	55 0 17	2326	53 14 55	2320
	Antares	E.	99 50 29	2412	98 7 11	2404	96 23 42	2397	94 40 3	2390
30	Sun	W.	93 38 35	2618	95 17 5	2611	96 55 45	2604	98 34 35	2597
	Venus	W.	52 51 14	2687	54 28 11	2679	56 5 19	2671	57 42 38	2663
	Saturn	W.	52 20 16	2337	54 5 21	2331	55 50 36	2324	57 36 0	2317
	Pollux	W.	50 46 52	2389	52 30 43	2378	54 14 49	2368	55 59 10	2358
	Spica	E.	40 5 3	2366	38 20 40	2365	36 36 15	2365	34 51 50	2366
	Jupiter	E.	44 25 50	2289	42 39 35	2284	40 53 12	2279	39 6 42	2274
	Antares	E.	85 59 15	2356	84 14 37	2350	82 29 50	2344	80 44 54	2338
31	Sun	W.	106 50 53	2567	108 30 33	2562	110 10 20	2557	111 50 14	2552
	Saturn	W.	66 25 19	2287	68 11 37	2282	69 58 3	2277	71 44 36	2272
	Venus	W.	65 51 47	2627	67 30 5	2621	69 8 32	2614	70 47 8	2609
	Pollux	W.	64 44 12	2317	66 29 47	2310	68 15 32	2303	70 1 27	2296
	Regulus	W.	28 22 28	2249	30 9 43	2243	31 57 6	2239	33 44 36	2234
	Antares	E.	71 58 21	2315	70 12 43	2311	68 26 59	2307	66 41 10	2304

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
19	Sun	E.	33° 58′ 9″	3414	32° 36′ 8″	3410	31° 14′ 3″	3407	29° 51′ 54″	3405
20	Fomalhaut	W.	64 46 44	3273	66 11 27	3256	67 36 30	3241	69 1 51	3225
	α Pegasi	W.	50 35 22	3491	51 55 56	3459	53 17 6	3430	54 38 49	3402
	Sun	E.	23 0 49	3407	21 38 41	3413	20 16 39	3422	18 54 47	3436
24	Sun	W.	24 34 37	3064	26 3 30	3046	27 32 46	3029	29 2 23	3012
	Saturn	E.	22 8 20	2714	20 31 59	2711	18 55 34	2710	17 19 8	2713
	Regulus	E.	60 41 7	2641	59 3 8	2632	57 24 57	2624	55 46 34	2615
25	Sun	W.	36 35 11	2943	38 6 35	2931	39 38 14	2920	41 10 7	2909
	Regulus	E.	47 31 44	2572	45 52 10	2564	44 12 25	2555	42 32 28	2547
	Spica	E.	101 15 58	2600	99 37 3	2591	97 57 56	2583	96 18 38	2574
26	Sun	W.	48 53 5	2855	50 26 21	2846	51 59 49	2836	53 33 30	2827
	Regulus	E.	34 9 53	2506	32 28 48	2498	30 47 32	2490	29 6 5	2482
	Spica	E.	87 59 13	2533	86 18 46	2525	84 38 8	2517	82 57 19	2510
	Jupiter	E.	92 55 3	2487	91 13 32	2480	89 31 50	2472	87 49 57	2464
27	Sun	W.	61 25 0	2780	62 59 54	2771	64 35 0	2762	66 10 18	2753
	Spica	E.	74 30 34	2472	72 48 42	2465	71 6 39	2458	69 24 27	2451
	Jupiter	E.	79 17 47	2425	77 34 48	2418	75 51 39	2410	74 8 19	2403
28	Sun	W.	74 9 38	2710	75 46 4	2702	77 22 41	2694	78 59 29	2686
	Venus	W.	33 44 31	2811	35 18 44	2798	36 53 14	2786	38 28 0	2775
	Saturn	W.	31 33 30	2432	33 16 19	2424	34 59 20	2415	36 42 34	2406
	Pollux	W.	30 28 0	2598	32 6 58	2570	33 46 34	2546	35 26 43	2524
	Spica	E.	60 51 1	2418	59 7 52	2412	57 24 34	2406	55 41 8	2401
	Jupiter	E.	65 29 3	2367	63 44 41	2359	62 0 8	2353	60 15 25	2346
29	Sun	W.	87 6 9	2646	88 44 1	2639	90 22 3	2632	92 0 14	2625
	Venus	W.	46 25 24	2723	48 1 33	2713	49 37 55	2704	51 14 29	2696
	Saturn	W.	45 21 40	2366	47 6 3	2359	48 50 37	2352	50 35 21	2344
	Pollux	W.	43 54 21	2438	45 37 1	2425	47 20 0	2412	49 3 17	2400
	Spica	E.	47 2 4	2377	45 17 56	2373	43 33 42	2370	41 49 24	2368
	Jupiter	E.	51 29 24	2313	49 43 44	2307	47 57 55	2301	46 11 57	2295
	Antares	E.	92 56 14	2382	91 12 14	2375	89 28 4	2368	87 43 44	2362
30	Sun	W.	100 13 34	2591	101 52 41	2585	103 31 57	2579	105 11 21	2573
	Venus	W.	59 20 8	2655	60 57 48	2648	62 35 38	2640	64 13 38	2634
	Saturn	W.	59 21 34	2311	61 7 17	2305	62 53 9	2299	64 39 10	2294
	Pollux	W.	57 43 45	2349	59 28 33	2340	61 13 34	2332	62 58 47	2324
	Spica	E.	33 7 27	2369	31 23 8	2374	29 38 56	2381	27 54 54	2391
	Jupiter	E.	37 20 5	2270	35 33 21	2266	33 46 31	2262	31 59 36	2260
	Antares	E.	78 59 50	2333	77 14 38	2328	75 29 19	2323	73 43 53	2319
31	Sun	W.	113 30 15	2548	115 10 22	2544	116 50 34	2540	118 30 52	2536
	Saturn	W.	73 31 16	2268	75 18 3	2263	77 4 57	2259	78 51 57	2256
	Venus	W.	72 25 51	2603	74 4 42	2598	75 43 40	2593	77 22 44	2589
	Pollux	W.	71 47 32	2291	73 33 45	2285	75 20 6	2281	77 6 34	2276
	Regulus	W.	35 32 13	2229	37 19 57	2225	39 7 48	2220	40 55 45	2217
	Antares	E.	64 55 17	2302	63 9 20	2300	61 23 20	2299	59 37 19	2298

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.		Added to Apparent Time.	
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Wed.	1	4 36 8.00	10.227	N.22 3 8.5	+20.46	15 48.37	68.41	2 28.26	0.370
Thur.	2	4 40 13.65	10.243	22 11 8.0	19.49	15 48.24	68.47	2 19.19	0.386
Frid.	3	4 44 19.68	10.259	22 18 44.3	18.52	15 48.12	68.52	2 9.75	0.402
Sat.	4	4 48 26.07	10.273	22 25 57.1	+17.54	15 47.99	68.57	1 59.95	0.416
SUN.	5	4 52 32.80	10.287	22 32 46.4	16.56	15 47.87	68.62	1 49.80	0.430
Mon.	6	4 56 39.86	10.300	22 39 12.0	15.57	15 47.75	68.66	1 39.33	0.443
Tues.	7	5 0 47.23	10.313	22 45 13.8	+14.57	15 47.63	68.70	1 28.55	0.456
Wed.	8	5 4 54.90	10.325	22 50 51.7	13.57	15 47.52	68.74	1 17.47	0.468
Thur.	9	5 9 2.86	10.337	22 56 5.6	12.57	15 47.41	68.78	1 6.10	0.480
Frid.	10	5 13 11.08	10.347	23 0 55.3	+11.56	15 47.31	68.82	0 54.46	0.490
Sat.	11	5 17 19.55	10.357	23 5 20.8	10.55	15 47.21	68.85	0 42.57	0.500
SUN.	12	5 21 28.25	10.366	23 9 21.9	9.53	15 47.11	68.88	0 30.47	0.509
Mon.	13	5 25 37.16	10.375	23 12 58.5	+ 8.51	15 47.02	68.90	0 18.15	0.518
Tues.	14	5 29 46.26	10.382	23 16 10.6	7.49	15 46.93	68.92	0 5.65	0.525
Wed.	15	5 33 55.51	10.388	23 18 58.2	6.47	15 46.85	68.94	0 7.02	0.531
Thur.	16	5 38 4.90	10.393	23 21 21.1	+ 5.44	15 46.77	68.96	0 19.83	0.536
Frid.	17	5 42 14.42	10.397	23 23 19.4	4.41	15 46.70	68.97	0 32.75	0.540
Sat.	18	5 46 24.02	10.400	23 24 52.9	3.38	15 46.63	68.98	0 45.75	0.543
SUN.	19	5 50 33.68	10.402	23 26 1.6	+ 2.35	15 46.57	68.98	0 58.82	0.545
Mon.	20	5 54 43.38	10.403	23 26 45.6	1.32	15 46.51	68.98	1 11.92	0.546
Tues.	21	5 58 53.08	10.403	23 27 4.8	+ 0.28	15 46.45	68.98	1 25.02	0.546
Wed.	22	6 3 2.76	10.401	23 26 59.2	− 0.75	15 46.40	68.97	1 38.10	0.544
Thur.	23	6 7 12.39	10.399	23 26 28.7	1.78	15 46.36	68.96	1 51.14	0.542
Frid.	24	6 11 21.93	10.395	23 25 33.4	2.82	15 46.32	68.95	2 4.10	0.538
Sat.	25	6 15 31.37	10.390	23 24 13.4	− 3.85	15 46.28	68.94	2 16.95	0.533
SUN.	26	6 19 40.68	10.384	23 22 28.8	4.88	15 46.25	68.92	2 29.66	0.527
Mon.	27	6 23 49.83	10.377	23 20 19.4	5.90	15 46.23	68.90	2 42.22	0.520
Tues.	28	6 27 58.79	10.369	23 17 45.4	− 6.93	15 46.21	68.88	2 54.60	0.512
Wed.	29	6 32 7.56	10.360	23 14 46.9	7.95	15 46.19	68.85	3 6.78	0.503
Thur.	30	6 36 16.10	10.350	23 11 23.9	8.97	15 46.18	68.82	3 18.73	0.493
Frid.	31	6 40 24.40	10.340	N.23 7 36.5	− 9.98	15 46.17	68.79	3 30.43	0.483

Note.—The mean time of semidiameter passing may be found by subtracting 0s.19 from the sidereal time. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to / Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Wed.	1	4 36 8.43	10.226	N. 22 3 9.3	+20.46	2 28.25	0.370	4 38 36.68
Thur.	2	4 40 14.05	10.242	22 11 8.7	19.49	2 19.19	0.386	4 42 33.24
Frid.	3	4 44 20.05	10.258	22 18 44.9	18.52	2 9.74	0.402	4 46 29.79
Sat.	4	4 48 26.41	10.272	22 25 57.7	+17.54	1 59.94	0.416	4 50 26.35
SUN.	5	4 52 33.11	10.286	22 32 46.9	16.56	1 49.79	0.430	4 54 22.90
Mon.	6	4 56 40.14	10.299	22 39 12.4	15.57	1 39.32	0.443	4 58 19.46
Tues.	7	5 0 47.48	10.312	22 45 14.2	+14.57	1 28.54	0.456	5 2 16.02
Wed.	8	5 4 55.12	10.324	22 50 52.0	13.57	1 17.46	0.468	5 6 12.58
Thur.	9	5 9 3.05	10.336	22 56 5.8	12.57	1 6.08	0.480	5 10 9.13
Frid.	10	5 13 11.24	10.346	23 0 55.5	+11.56	0 54.45	0.490	5 14 5.69
Sat.	11	5 17 19.68	10.356	23 5 20.9	10.55	0 42.56	0.500	5 18 2.24
SUN.	12	5 21 28.34	10.365	23 9 21.9	9.53	0 30.46	0.509	5 21 58.80
Mon.	13	5 25 37.21	10.374	23 12 58.5	+ 8.51	0 18.15	0.518	5 25 55.36
Tues.	14	5 29 46.27	10.381	23 16 10.6	7.49	0 5.65	0.525	5 29 51.92
Wed.	15	5 33 55.49	10.387	23 18 58.2	6.47	0 7.02	0.531	5 33 48.47
Thur.	16	5 38 4.85	10.392	23 21 21.1	+ 5.44	0 19.82	0.536	5 37 45.03
Frid.	17	5 42 14.33	10.396	23 23 19.4	4.41	0 32.74	0.540	5 41 41.59
Sat.	18	5 46 23.89	10.399	23 24 52.9	3.38	0 45.74	0.543	5 45 38.15
SUN.	19	5 50 33.51	10.401	23 26 1.6	+ 2.35	0 58.81	0.545	5 49 34.70
Mon.	20	5 54 43.17	10.402	23 26 45.6	1.32	1 11.91	0.546	5 53 31.26
Tues.	21	5 58 52.83	10.402	23 27 4.8	+ 0.28	1 25.01	0.546	5 57 27.82
Wed.	22	6 3 2.47	10.400	23 26 59.2	− 0.75	1 38.09	0.544	6 1 24.38
Thur.	23	6 7 12.06	10.398	23 26 28.8	1.78	1 51.13	0.542	6 5 20.93
Frid.	24	6 11 21.57	10.394	23 25 33.6	2.82	2 4.08	0.538	6 9 17.49
Sat.	25	6 15 30.97	10.389	23 24 13.6	− 3.85	2 16.93	0.533	6 13 14.04
SUN.	26	6 19 40.24	10.383	23 22 29.0	4.88	2 29.64	0.527	6 17 10.60
Mon.	27	6 23 49.36	10.376	23 20 19.7	5.90	2 42.20	0.520	6 21 7.16
Tues.	28	6 27 58.29	10.368	23 17 45.8	− 6.93	2 54.57	0.512	6 25 3.72
Wed.	29	6 32 7.02	10.359	23 14 47.3	7.95	3 6.75	0.503	6 29 0.27
Thur.	30	6 36 15.53	10.349	23 11 24.4	8.97	3 18.70	0.493	6 32 56.83
Frid.	31	6 40 23.79	10.339	N. 23 7 37.1	− 9.98	3 30.40	0.483	6 36 53.39

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

Diff. for 1 Hour, + 9ˢ.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	152	70 38 18.7	38 9.4	143.64	+ 0.39	0.0061920	+ 25.1	19 18 13.05
2	153	71 35 45.5	35 36.0	143.59	0.47	0.0062513	24.5	19 14 17.14
3	154	72 33 11.1	33 1.4	143.54	0.52	0.0063092	23.9	19 10 21.23
4	155	73 30 35.5	30 25.6	143.49	+ 0.54	0.0063658	+ 23.3	19 6 25.33
5	156	74 27 58.9	27 48.9	143.45	0.53	0.0064210	22.8	19 2 29.42
6	157	75 25 21.4	25 11.3	143.42	0.49	0.0064750	22.2	18 58 33.51
7	158	76 22 43.1	22 32.8	143.39	+ 0.43	0.0065278	+ 21.7	18 54 37.60
8	159	77 20 4.1	19 53.6	143.36	0.34	0.0065792	21.1	18 50 41.68
9	160	78 17 24.4	17 13.7	143.33	0.23	0.0066293	20.6	18 46 45.76
10	161	79 14 44.2	14 33.4	143.31	+ 0.11	0.0066780	+ 20.0	18 42 49.84
11	162	80 12 3.4	11 52.5	143.29	− 0.02	0.0067252	19.3	18 38 53.94
12	163	81 9 22.2	9 11.1	143.27	0.15	0.0067707	18.6	18 34 58.03
13	164	82 6 40.6	6 29.3	143.26	− 0.27	0.0068145	+ 17.9	18 31 2.11
14	165	83 3 58.6	3 47.1	143.24	0.38	0.0068564	17.0	18 27 6.20
15	166	84 1 16.3	1 4.7	143.23	0.47	0.0068962	16.1	18 23 10.29
16	167	84 58 33.7	58 22.0	143.21	− 0.52	0.0069338	+ 15.2	18 19 14.39
17	168	85 55 50.8	55 38.9	143.20	0.55	0.0069690	14.2	18 15 18.47
18	169	86 53 7.5	52 55.4	143.19	0.55	0.0070018	13.2	18 11 22.56
19	170	87 50 23.9	50 11.6	143.18	− 0.52	0.0070321	+ 12.1	18 7 26.65
20	171	88 47 40.0	47 27.6	143.17	0.46	0.0070599	11.1	18 3 30.75
21	172	89 44 55.7	44 43.2	143.15	0.37	0.0070851	9.9	17 59 34.83
22	173	90 42 11.0	41 58.3	143.13	− 0.27	0.0071076	+ 8.9	17 55 38.92
23	174	91 39 25.9	39 13.0	143.11	0.15	0.0071275	7.8	17 51 43.01
24	175	92 36 40.3	36 27.2	143.09	− 0.01	0.0071448	6.8	17 47 47.10
25	176	93 33 54.2	33 41.0	143.07	+ 0.13	0.0071597	+ 5.7	17 43 51.18
26	177	94 31 7.7	30 54.3	143.05	0.26	0.0071723	4.7	17 39 55.27
27	178	95 28 20.7	28 7.1	143.03	0.38	0.0071825	3.8	17 35 59.36
28	179	96 25 33.1	25 19.3	143.01	+ 0.49	0.0071905	+ 2.9	17 32 3.46
29	180	97 22 45.1	22 31.1	142.99	0.58	0.0071964	2.1	17 28 7.54
30	181	98 19 56.8	19 42.7	142.98	0.64	0.0072005	1.3	17 24 11.63
31	182	99 17 8.2	16 54.0	142.97	+ 0.66	0.0072029	+ 0.6	17 20 15.72

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0d.0.

Diff. for 1 Hour, — 9s.8296. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 18.3	16 19.3	59 43.8	+0.37	59 47.2	+0.19	8 25.1	2.18	9.5
2	16 19.6	16 19.2	59 48.3	−0.01	59 46.9	−0.23	9 18.0	2.23	10.5
3	16 18.1	16 16.3	59 42.9	0.45	59 36.2	0.68	10 12.0	2.28	11.5
4	16 13.7	16 10.4	59 26.7	−0.90	59 14.6	−1.11	11 7.3	2.33	12.5
5	16 6.4	16 1.8	59 0.0	1.31	58 43.2	1.48	12 3.7	2.35	13.5
6	15 56.7	15 51.2	58 24.4	1.63	58 4.0	1.75	13 0.1	2.33	14.5
7	15 45.3	15 39.2	57 42.5	−1.83	57 20.2	−1.87	13 55.5	2.27	15.5
8	15 33.1	15 27.0	56 57.7	1.87	56 35.4	1.84	14 48.9	2.17	16.5
9	15 21.1	15 15.5	56 13.6	1.77	55 52.9	1.67	15 39.5	2.05	17.5
10	15 10.2	15 5.3	55 33.5	−1.55	55 15.7	−1.40	16 27.4	1.94	18.5
11	15 1.0	14 57.3	54 59.9	1.23	54 46.2	1.05	17 12.7	1.84	19.5
12	14 54.2	14 51.7	54 34.8	0.85	54 25.8	0.64	17 56.1	1.78	20.5
13	14 50.0	14 48.9	54 19.3	−0.43	54 15.5	−0.21	18 38.4	1.74	21.5
14	14 48.6	14 48.9	54 14.2	0.00	54 15.5	+0.21	19 20.3	1.75	22.5
15	14 50.0	14 51.7	54 19.3	+0.42	54 25.5	0.61	20 2.6	1.79	23.5
16	14 53.9	14 56.8	54 33.9	+0.79	54 44.4	+0.95	20 46.2	1.85	24.5
17	15 0.2	15 4.0	54 56.8	1.10	55 10.9	1.23	21 31.8	1.95	25.5
18	15 8.2	15 12.8	55 26.4	1.34	55 43.1	1.42	22 19.8	2.06	26.5
19	15 17.6	15 22.5	56 0.6	+1.48	56 18.7	+1.52	23 10.7	2.18	27.5
20	15 27.5	15 32.4	56 37.0	1.52	56 55.2	1.50	☌		28.5
21	15 37.3	15 42.0	57 13.1	1.46	57 30.3	1.40	0 4.0	2.27	0.0
22	15 46.4	15 50.6	57 46.6	+1.32	58 1.9	+1.22	0 59.2	2.32	1.0
23	15 54.4	15 57.8	58 16.0	1.11	58 28.6	0.99	1 55.2	2.33	2.0
24	16 0.9	16 3.6	58 39.8	0.88	58 49.6	0.75	2 50.8	2.30	3.0
25	16 5.8	16 7.7	58 57.8	+0.63	59 4.6	+0.51	3 45.4	2.24	4.0
26	16 9.1	16 10.2	59 10.0	0.39	59 14.0	0.28	4 38.5	2.18	5.0
27	16 10.9	16 11.3	59 16.7	+0.17	59 18.1	+0.06	5 30.4	2.14	6.0
28	16 11.4	16 11.1	59 18.2	−0.04	59 17.1	−0.15	6 21.7	2.13	7.0
29	16 10.4	16 9.4	59 14.7	0.25	59 11.1	0.35	7 13.1	2.15	8.0
30	16 8.1	16 6.4	59 6.2	0.47	58 59.9	0.58	8 5.1	2.20	9.0
31	16 4.3	16 1.8	58 52.2	−0.70	58 43.1	−0.82	8 58.4	2.25	10.0

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 46 2.52	2.2614	S. 0 47 50.2	12.143
1	12 48 18.23	2.2622	0 59 58.8	12.142
2	12 50 33.99	2.2632	1 12 7.2	12.138
3	12 52 49.81	2.2642	1 24 15.4	12.134
4	12 55 5.69	2.2652	1 36 23.3	12.128
5	12 57 21.63	2.2662	1 48 30.8	12.122
6	12 59 37.63	2.2672	2 0 37.9	12.113
7	13 1 53.69	2.2682	2 12 44.4	12.103
8	13 4 9.82	2.2693	2 24 50.3	12.093
9	13 6 26.01	2.2704	2 36 55.6	12.082
10	13 8 42.27	2.2717	2 49 0.1	12.068
11	13 10 58.61	2.2730	3 1 3.7	12.053
12	13 13 15.03	2.2742	3 13 6.4	12.037
13	13 15 31.52	2.2755	3 25 8.1	12.019
14	13 17 48.09	2.2768	3 37 8.7	12.001
15	13 20 4.74	2.2782	3 49 8.2	11.981
16	13 22 21.47	2.2796	4 1 6.4	11.959
17	13 24 38.29	2.2811	4 13 3.3	11.937
18	13 26 55.20	2.2826	4 24 58.9	11.914
19	13 29 12.20	2.2841	4 36 53.0	11.888
20	13 31 29.29	2.2856	4 48 45.5	11.862
21	13 33 46.47	2.2872	5 0 36.4	11.834
22	13 36 3.75	2.2888	5 12 25.6	11.805
23	13 38 21.12	2.2904	S. 5 24 13.0	11.775

THURSDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 40 38.59	2.2921	S. 5 35 58.6	11.743
1	13 42 56.17	2.2938	5 47 42.2	11.710
2	13 45 13.85	2.2955	5 59 23.8	11.676
3	13 47 31.63	2.2972	6 11 3.3	11.640
4	13 49 49.52	2.2990	6 22 40.6	11.603
5	13 52 7.51	2.3008	6 34 15.7	11.565
6	13 54 25.61	2.3026	6 45 48.4	11.525
7	13 56 43.82	2.3044	6 57 18.7	11.484
8	13 59 2.14	2.3063	7 8 46.5	11.442
9	14 1 20.58	2.3082	7 20 11.8	11.399
10	14 3 39.13	2.3102	7 31 34.4	11.353
11	14 5 57.80	2.3122	7 42 54.2	11.307
12	14 8 16.59	2.3141	7 54 11.3	11.261
13	14 10 35.49	2.3160	8 5 25.5	11.212
14	14 12 54.51	2.3181	8 16 36.7	11.162
15	14 15 13.66	2.3202	8 27 44.9	11.111
16	14 17 32.93	2.3222	8 38 50.0	11.058
17	14 19 52.32	2.3242	8 49 51.9	11.004
18	14 22 11.83	2.3262	9 0 50.5	10.949
19	14 24 31.47	2.3283	9 11 45.8	10.892
20	14 26 51.23	2.3303	9 22 37.6	10.834
21	14 29 11.11	2.3324	9 33 25.9	10.776
22	14 31 31.12	2.3346	9 44 10.7	10.716
23	14 33 51.26	2.3367	9 54 51.8	10.654
24	14 36 11.52	2.3388	S. 10 5 29.2	10.592

FRIDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 36 11.52	2.3388	S. 10 5 29.2	10.592
1	14 38 31.91	2.3409	10 16 2.8	10.528
2	14 40 52.43	2.3431	10 26 32.5	10.462
3	14 43 13.08	2.3452	10 36 58.2	10.395
4	14 45 33.86	2.3473	10 47 19.9	10.327
5	14 47 54.76	2.3494	10 57 37.5	10.259
6	14 50 15.79	2.3516	11 7 51.0	10.189
7	14 52 36.95	2.3537	11 18 0.2	10.117
8	14 54 58.24	2.3559	11 28 5.1	10,044
9	14 57 19.66	2.3580	11 38 5.5	9.970
10	14 59 41.20	2.3601	11 48 1.5	9.896
11	15 2 2.87	2.3622	11 57 53.0	9.820
12	15 4 24.67	2.3643	12 7 39.9	9.742
13	15 6 46.59	2.3664	12 17 22.1	9.664
14	15 9 8.64	2.3686	12 26 59.6	0.564
15	15 11 30.82	2.3707	12 36 32.2	9.503
16	15 13 53.12	2.3727	12 45 59.9	9.421
17	15 16 15.55	2.3748	12 55 22.7	9.338
18	15 18 38.10	2.3768	13 4 40.5	9.254
19	15 21 0.77	2.3788	13 13 53.2	9.169
20	15 23 23.56	2.3809	13 23 0.8	9.082
21	15 25 46.48	2.3829	13 32 3.1	8.994
22	15 28 9.51	2.3848	13 41 0.1	8.906
23	15 30 32.65	2.3867	S. 13 49 51.8	8.817

SATURDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 32 55.91	2.3887	S. 13 58 38.1	8.726
1	15 35 19.29	2.3906	14 7 18.9	8.634
2	15 37 42.78	2.3924	14 15 54.2	8.542
3	15 40 6.38	2.3943	14 24 23.9	8.448
4	15 42 30.09	2.3961	14 32 48.0	8.353
5	15 44 53.91	2.3979	14 41 6.3	8.257
6	15 47 17.84	2.3997	14 49 18.8	8.160
7	15 49 41.87	2.4014	14 57 25.5	8.063
8	15 52 6.00	2.4031	15 5 26.4	7.966
9	15 54 30.24	2.4047	15 13 21.4	7.866
10	15 56 54.57	2.4063	15 21 10.3	7.764
11	15 59 19.00	2.4079	15 28 53.1	7.663
12	16 1 43.52	2.4094	15 36 29.8	7.561
13	16 4 8.13	2.4109	15 44 0.4	7.458
14	16 6 32.83	2.4124	15 51 24.8	7.354
15	16 8 57.62	2.4138	15 58 42.9	7.249
16	16 11 22.49	2.4151	16 5 54.7	7.144
17	16 13 47.44	2.4164	16 13 0.2	7.038
18	16 16 12.46	2.4177	16 19 59.3	6.932
19	16 18 37.56	2.4189	16 26 52.0	6.823
20	16 21 2.73	2.4201	16 33 38.1	6.714
21	16 23 27.98	2.4213	16 40 17.7	6.605
22	16 25 53.29	2.4223	16 46 50.7	6.495
23	16 28 18.66	2.4233	16 53 17.1	6.384
24	16 30 44.09	2.4243	S. 16 59 36.8	6.273

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 5.					**TUESDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 30 44.09	2.4243	S. 16 59 36.8	6.273	0	18 26 58.76	2.3922	S. 19 44 35.3	0.540
1	16 33 9.58	2.4252	17 5 49.8	6.161	1	18 29 22.22	2.3898	19 45 4.1	0.421
2	16 35 35.12	2.4261	17 11 56.1	6.048	2	18 31 45.53	2.3873	19 45 25.8	0.302
3	16 38 0.71	2.4268	17 17 55.6	5.935	3	18 34 8.70	2.3848	19 45 40.4	0.184
4	16 40 26.34	2.4275	17 23 48.3	5.822	4	18 36 31.71	2.3822	19 45 47.9	−0.066
5	16 42 52.01	2.4282	17 29 34.2	5.707	5	18 38 54.56	2.3795	19 45 48.3	+0.052
6	16 45 17.72	2.4288	17 35 13.2	5.592	6	18 41 17.25	2.3768	19 45 41.6	0.170
7	16 47 43.47	2.4294	17 40 45.3	5.477	7	18 43 39.78	2.3741	19 45 27.9	0.287
8	16 50 9.25	2.4298	17 46 10.4	5.361	8	18 46 2.14	2.3712	19 45 7.2	0.403
9	16 52 35.05	2.4302	17 51 28.6	5.245	9	18 48 24.32	2.3682	19 44 39.6	0.519
10	16 55 0.88	2.4306	17 56 39.8	5.127	10	18 50 46.32	2.3652	19 44 5.0	0.634
11	16 57 26.73	2.4310	18 1 43.9	5.009	11	18 53 8.14	2.3622	19 43 23.5	0.749
12	16 59 52.60	2.4312	18 6 40.9	4.892	12	18 55 29.78	2.3591	19 42 35.1	0.863
13	17 2 18.48	2.4313	18 11 30.9	4.774	13	18 57 51.23	2.3559	19 41 39.9	0.977
14	17 4 44.36	2.4314	18 16 13.8	4.655	14	19 0 12.49	2.3527	19 40 37.8	1.091
15	17 7 10.25	2.4315	18 20 49.5	4.536	15	19 2 33.56	2.3495	19 39 28.9	1.204
16	17 9 36.14	2.4314	18 25 18.1	4.417	16	19 4 54.43	2.3461	19 38 13.3	1.317
17	17 12 2.02	2.4313	18 29 39.5	4.297	17	19 7 15.09	2.3427	19 36 50.9	1.429
18	17 14 27.90	2.4312	18 33 53.7	4.177	18	19 9 35.55	2.3393	19 35 21.8	1.540
19	17 16 53.77	2.4310	18 38 0.7	4.057	19	19 11 55.81	2.3359	19 33 46.1	1.650
20	17 19 19.62	2.4306	18 42 0.5	3.937	20	19 14 15.86	2.3323	19 32 3.8	1.760
21	17 21 45.44	2.4302	18 45 53.1	3.816	21	19 16 35.69	2.3287	19 30 14.9	1.870
22	17 24 11.24	2.4297	18 49 38.4	3.695	22	19 18 55.30	2.3250	19 28 19.4	1.979
23	17 26 37.01	2.4292	S. 18 53 16.5	3.573	23	19 21 14.69	2.3213	S. 19 26 17.4	2.087
	MONDAY 6.					**WEDNESDAY 8.**			
0	17 29 2.74	2.4286	S. 18 56 47.2	3.451	0	19 23 33.86	2.3176	S. 19 24 8.9	2.195
1	17 31 28.44	2.4279	19 0 10.6	3.330	1	19 25 52.81	2.3139	19 21 54.0	2.302
2	17 33 54.09	2.4272	19 3 26.8	3.209	2	19 28 11.53	2.3101	19 19 32.7	2.408
3	17 36 19.70	2.4264	19 6 35.7	3.088	3	19 30 30.02	2.3062	19 17 5.1	2.513
4	17 38 45.26	2.4255	19 9 37.3	2.966	4	19 32 48.28	2.3024	19 14 31.1	2.618
5	17 41 10.76	2.4245	19 12 31.6	2.843	5	19 35 6.31	2.2985	19 11 50.9	2.723
6	17 43 36.20	2.4235	19 15 18.5	2.721	6	19 37 24.10	2.2945	19 9 4.4	2.827
7	17 46 1.58	2.4223	19 17 58.1	2.599	7	19 39 41.65	2.2905	19 6 11.7	2.929
8	17 48 26.88	2.4211	19 20 30.4	2.478	8	19 41 58.96	2.2864	19 3 12.9	3.031
9	17 50 52.11	2.4198	19 22 55.4	2.356	9	19 44 16.02	2.2823	19 0 8.0	3.132
10	17 53 17.26	2.4185	19 25 13.1	2.233	10	19 46 32.84	2.2782	18 56 57.0	3.233
11	17 55 42.33	2.4172	19 27 23.4	2.111	11	19 48 49.41	2.2742	18 53 40.0	3.333
12	17 58 7.32	2.4157	19 29 26.4	1.990	12	19 51 5.74	2.2701	18 50 17.1	3.432
13	18 0 32.21	2.4140	19 31 22.2	1.868	13	19 53 21.82	2.2658	18 46 48.2	3.531
14	18 2 57.00	2.4124	19 33 10.6	1.746	14	19 55 37.64	2.2615	18 43 13.4	3.628
15	18 5 21.70	2.4108	19 34 51.7	1.624	15	19 57 53.20	2.2572	18 39 32.8	3.725
16	18 7 46.30	2.4090	19 36 25.5	1.503	16	20 0 8.51	2.2530	18 35 46.4	3.821
17	18 10 10.78	2.4071	19 37 52.1	1.382	17	20 2 23.56	2.2487	18 31 54.3	3.916
18	18 12 35.15	2.4052	19 39 11.4	1.261	18	20 4 38.36	2.2445	18 27 56.5	4.011
19	18 14 59.40	2.4032	19 40 23.4	1.140	19	20 6 52.90	2.2402	18 23 53.0	4.105
20	18 17 23.53	2.4012	19 41 28.2	1.020	20	20 9 7.18	2.2358	18 19 43.9	4.197
21	18 19 47.54	2.3991	19 42 25.8	0.899	21	20 11 21.19	2.2314	18 15 29.3	4.289
22	18 22 11.42	2.3968	19 43 16.1	0.779	22	20 13 31.94	2.2270	18 11 9.2	4.381
23	18 24 35.16	2.3945	19 43 59.3	0.660	23	20 15 48.43	2.2226	18 6 43.6	4.472
24	18 26 58.76	2.3922	S. 19 44 35.3	0.540	24	20 18 1.65	2.2182	S. 18 2 12.6	4.561

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 9.					SATURDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 18 1.65	2.2182	S. 18 2 12.6	4.561	0	21 59 26.25	2.0129	S. 12 55 17.6	7.920
1	20 20 14.61	2.2137	17 57 36.3	4.650	1	22 1 26.91	2.0092	12 47 20.9	7.970
2	20 22 27.30	2.2092	17 52 54.6	4.739	2	22 3 27.35	2.0054	12 39 21.2	8.021
3	20 24 39.72	2.2048	17 48 7.6	4.827	3	22 5 27.56	2.0017	12 31 18.4	8.071
4	20 26 51.88	2.2004	17 43 15.4	4.913	4	22 7 27.56	1.9981	12 23 12.7	8.119
5	20 29 3.77	2.1959	17 38 18.1	4.998	5	22 9 27.34	1.9945	12 15 4.1	8.166
6	20 31 15.39	2.1914	17 33 15.6	5.083	6	22 11 26.90	1.9909	12 6 52.7	8.213
7	20 33 26.74	2.1870	17 28 8.1	5.167	7	22 13 26.25	1.9875	11 58 38.5	8.260
8	20 35 37.83	2.1825	17 22 55.6	5.251	8	22 15 25.40	1.9841	11 50 21.5	8.307
9	20 37 48.65	2.1780	17 17 38.0	5.334	9	22 17 24.34	1.9806	11 42 1.7	8.352
10	20 39 59.19	2.1735	17 12 15.5	5.415	10	22 19 23.07	1.9772	11 33 39.2	8.397
11	20 42 9.47	2.1691	17 6 48.2	5.495	11	22 21 21.60	1.9738	11 25 14.1	8.440
12	20 44 19.48	2.1646	17 1 16.1	5.575	12	22 23 19.93	1.9705	11 16 46.4	8.483
13	20 46 29.22	2.1601	16 55 39.2	5.654	13	22 25 18.06	1.9673	11 8 16.1	8.526
14	20 48 38.69	2.1556	16 49 57.6	5.733	14	22 27 16.00	1.9641	10 59 43.3	8.567
15	20 50 47.89	2.1511	16 44 11.3	5.811	15	22 29 13.75	1.9609	10 51 8.0	8.608
16	20 52 56.82	2.1467	16 38 20.3	5.887	16	22 31 11.31	1.9577	10 42 30.3	8.649
17	20 55 5.49	2.1422	16 32 24.8	5.962	17	22 33 8.68	1.9546	10 33 50.1	8.690
18	20 57 13.89	2.1377	16 26 24.8	6.037	18	22 35 5.86	1.9515	10 25 7.5	8.729
19	20 59 22.02	2.1333	16 20 20.3	6.112	19	22 37 2.86	1.9486	10 16 22.6	8.767
20	21 1 29.89	2.1289	16 14 11.4	6.185	20	22 38 59.69	1.9457	10 7 35.5	8.804
21	21 3 37.49	2.1244	16 7 58.1	6.258	21	22 40 56.34	1.9427	9 58 46.1	8.841
22	21 5 44.82	2.1200	16 1 40.4	6.331	22	22 42 52.81	1.9398	9 49 54.5	8.878
23	21 7 51.89	2.1157	S. 15 55 18.4	6.402	23	22 44 49.11	1.9370	S. 9 41 0.7	8.914
	FRIDAY 10.					SUNDAY 12.			
0	21 9 58.70	2.1113	S. 15 48 52.2	6.472	0	22 46 45.25	1.9342	S. 9 32 4.8	8.949
1	21 12 5.25	2.1069	15 42 21.8	6.541	1	22 48 41.22	1.9315	9 23 6.8	8.984
2	21 14 11.53	2.1025	15 35 47.3	6.609	2	22 50 37.03	1.9288	9 14 6.7	9.018
3	21 16 17.55	2.0982	15 29 8.7	6.677	3	22 52 32.68	1.9262	9 5 4.6	9.051
4	21 18 23.31	2.0939	15 22 26.0	6.744	4	22 54 28.17	1.9236	8 56 0.5	9.084
5	21 20 28.82	2.0896	15 15 39.4	6.809	5	22 56 23.51	1.9210	8 46 54.5	9.117
6	21 22 34.07	2.0853	15 8 48.9	6.874	6	22 58 18.69	1.9184	8 37 46.5	9.148
7	21 24 39.06	2.0811	15 1 54.5	6.939	7	23 0 13.72	1.9160	8 28 36.7	9.179
8	21 26 43.80	2.0768	14 54 56.2	7.003	8	23 2 8.61	1.9137	8 19 25.1	9.209
9	21 28 48.28	2.0726	14 47 54.1	7.066	9	23 4 3.36	1.9113	8 10 11.6	9.239
10	21 30 52.51	2.0685	14 40 48.3	7.129	10	23 5 57.97	1.9090	8 0 56.4	9.268
11	21 32 56.50	2.0643	14 33 38.7	7.191	11	23 7 52.44	1.9067	7 51 39.4	9.297
12	21 35 0.23	2.0601	14 26 25.4	7.252	12	23 9 46.78	1.9046	7 42 20.7	9.325
13	21 37 3.71	2.0560	14 19 8.5	7.311	13	23 11 40.99	1.9024	7 33 0.4	9.352
14	21 39 6.95	2.0520	14 11 48.1	7.369	14	23 13 35.07	1.9002	7 23 38.5	9.379
15	21 41 9.95	2.0479	14 4 24.2	7.427	15	23 15 29.02	1.8982	7 14 14.9	9.406
16	21 43 12.70	2.0439	13 56 56.8	7.485	16	23 17 22.85	1.8962	7 4 49.8	9.431
17	21 45 15.22	2.0400	13 49 26.0	7.542	17	23 19 16.56	1.8943	6 55 23.2	9.456
18	21 47 17.50	2.0360	13 41 51.7	7.599	18	23 21 10.16	1.8924	6 45 55.1	9.480
19	21 49 19.54	2.0320	13 34 14.1	7.654	19	23 23 3.65	1.8906	6 36 25.6	9.503
20	21 51 21.34	2.0281	13 26 33.2	7.708	20	23 24 57.03	1.8887	6 26 54.7	9.527
21	21 53 22.91	2.0242	13 18 49.1	7.762	21	23 26 50.29	1.8869	6 17 22.3	9.551
22	21 55 24.25	2.0204	13 11 1.8	7.815	22	23 28 43.45	1.8853	6 7 48.6	9.573
23	21 57 25.36	2.0167	13 3 11.3	7.868	23	23 30 36.52	1.8837	5 58 13.6	9.594
24	21 59 26.25	2.0129	S. 12 55 17.6	7.920	24	23 32 29.49	1.8821	S. 5 48 37.3	9.615

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 13.					**WEDNESDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 32 29.49	1.8821	S. 5 48 37.3	9.615	0	1 1 59.50	1.8677	N. 2 6 51.5	9.991
1	23 34 22.37	1.8806	5 38 59.8	9.635	1	1 3 51.59	1.8687	2 16 50.8	9.985
2	23 36 15.15	1.8789	5 29 21.1	9.656	2	1 5 43.74	1.8697	2 26 49.7	9.978
3	23 38 7.84	1.8775	5 19 41.1	9.676	3	1 7 35.96	1.8708	2 36 48.2	9.972
4	23 40 0.45	1.8762	5 10 0.0	9.694	4	1 9 28.24	1.8720	2 46 46.3	9.964
5	23 41 52.96	1.8748	5 0 17.8	9.712	5	1 11 20.60	1.8732	2 56 43.9	9.957
6	23 43 45.43	1.8736	4 50 34.5	9.730	6	1 13 13.03	1.8745	3 6 41.1	9.949
7	23 45 37.81	1.8723	4 40 50.2	9.747	7	1 15 5.54	1.8758	3 16 37.8	9.940
8	23 47 30.11	1.8711	4 31 4.9	9.763	8	1 16 58.13	1.8772	3 26 33.9	9.930
9	23 49 22.34	1.8700	4 21 18.6	9.780	9	1 18 50.80	1.8786	3 36 29.4	9.920
10	23 51 14.51	1.8689	4 11 31.3	9.796	10	1 20 43.56	1.8801	3 46 24.3	9.909
11	23 53 6.61	1.8678	4 1 43.1	9.811	11	1 22 36.41	1.8817	3 56 18.5	9.898
12	23 54 58.65	1.8669	3 51 54.0	9.825	12	1 24 29.36	1.8832	4 6 12.1	9.886
13	23 56 50.64	1.8660	3 42 4.1	9.839	13	1 26 22.40	1.8848	4 16 4.9	9.874
14	23 58 42.57	1.8651	3 32 13.4	9.853	14	1 28 15.54	1.8865	4 25 57.0	9.862
15	0 0 34.45	1.8643	3 22 21.8	9.866	15	1 30 8.78	1.8883	4 35 48.3	9.848
16	0 2 26.29	1.8636	3 12 29.5	9.878	16	1 32 2.13	1.8901	4 45 38.8	9.834
17	0 4 18.08	1.8629	3 2 36.5	9.889	17	1 33 55.59	1.8919	4 55 28.4	9.819
18	0 6 9.83	1.8622	2 52 42.8	9.901	18	1 35 49.15	1.8937	5 5 17.1	9.804
19	0 8 1.54	1.8616	2 42 48.4	9.912	19	1 37 42.83	1.8957	5 15 4.9	9.788
20	0 9 53.22	1.8611	2 32 53.4	9.922	20	1 39 36.63	1.8977	5 24 51.7	9.771
21	0 11 44.87	1.8606	2 22 57.8	9.931	21	1 41 30.55	1.8997	5 34 37.4	9.754
22	0 13 36.49	1.8602	2 13 1.7	9.940	22	1 43 24.60	1.9018	5 44 22.1	9.737
23	0 15 28.09	1.8598	S. 2 3 5.0	9.949	23	1 45 18.77	1.9039	N. 5 54 5.8	9.719
	TUESDAY 14.					**THURSDAY 16.**			
0	0 17 19.67	1.8595	S. 1 53 7.8	9.957	0	1 47 13.07	1.9061	N. 6 3 48.4	9.700
1	0 19 11.23	1.8592	1 43 10.1	9.965	1	1 49 7.50	1.9084	6 13 29.8	9.680
2	0 21 2.77	1.8589	1 33 12.0	9.972	2	1 51 2.07	1.9107	6 23 10.0	9.659
3	0 22 54.30	1.8588	1 23 13.5	9.978	3	1 52 56.78	1.9130	6 32 48.9	9.637
4	0 24 45.82	1.8587	1 13 14.6	9.984	4	1 54 51.63	1.9153	6 42 26.5	9.616
5	0 26 37.34	1.8587	1 3 15.4	9.989	5	1 56 46.62	1.9177	6 52 2.8	9.594
6	0 28 28.86	1.8587	0 53 15.9	9.994	6	1 58 41.75	1.9201	7 1 37.8	9.572
7	0 30 20.38	1.8587	0 43 16.1	9.998	7	2 0 37.03	1.9227	7 11 11.4	9.548
8	0 32 11.90	1.8588	0 33 16.1	10.002	8	2 2 32.47	1.9253	7 20 43.5	9.524
9	0 34 3.43	1.8589	0 23 15.8	10.006	9	2 4 28.07	1.9279	7 30 14.2	9.499
10	0 35 54.97	1.8592	0 13 15.4	10.009	10	2 6 23.82	1.9305	7 39 43.4	9.473
11	0 37 46.53	1.8594	S. 0 3 14.8	10.011	11	2 8 19.73	1.9332	7 49 11.0	9.447
12	0 39 38.10	1.8597	N. 0 6 45.9	10.012	12	2 10 15.80	1.9359	7 58 37.0	9.420
13	0 41 29.69	1.8601	0 16 46.7	10.013	13	2 12 12.04	1.9387	8 8 1.4	9.392
14	0 43 21.31	1.8605	0 26 47.5	10.014	14	2 14 8.45	1.9416	8 17 24.1	9.364
15	0 45 12.95	1.8609	0 36 48.4	10.014	15	2 16 5.03	1.9445	8 26 45.1	9.335
16	0 47 4.62	1.8615	0 46 49.2	10.013	16	2 18 1.79	1.9474	8 36 4.3	9.305
17	0 48 56.33	1.8622	0 56 50.0	10.012	17	2 19 58.72	1.9503	8 45 21.7	9.275
18	0 50 48.08	1.8628	1 6 50.7	10.011	18	2 21 55.83	1.9533	8 54 37.3	9.244
19	0 52 39.87	1.8635	1 16 51.3	10.009	19	2 23 53.12	1.9564	9 3 51.0	9.212
20	0 54 31.70	1.8642	1 26 51.7	10.006	20	2 25 50.60	1.9596	9 13 2.8	9.180
21	0 56 23.57	1.8649	1 36 52.0	10.003	21	2 27 48.27	1.9627	9 22 12.6	9.147
22	0 58 15.49	1.8658	1 46 52.1	9.999	22	2 29 46.12	1.9659	9 31 20.4	9.112
23	1 0 7.47	1.8667	1 56 51.9	9.995	23	2 31 44.17	1.9691	9 40 26.1	9.077
24	1 1 59.50	1.8677	N. 2 6 51.5	9.991	24	2 33 42.41	1.9723	N. 9 49 29.7	9.042

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 17.					**SUNDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 33 42.41	1.9723	N. 9 49 29.7	9.042	0	4 12 45.30	2.1636	N.16 7 51.9	6.403
1	2 35 40.85	1.9756	9 58 31.2	9.007	1	4 14 55.25	2.1680	16 14 13.8	6.327
2	2 37 39.49	1.9789	10 7 30.5	8.970	2	4 17 5.46	2.1723	16 20 31.2	6.251
3	2 39 38.32	1.9823	10 16 27.6	8.932	3	4 19 15.93	2.1767	16 26 44.0	6.174
4	2 41 37.36	1.9858	10 25 22.4	8.893	4	4 21 26.66	2.1810	16 32 52.1	6.095
5	2 43 36.61	1.9893	10 34 14.8	8.854	5	4 23 37.65	2.1854	16 38 55.4	6.015
6	2 45 36.07	1.9928	10 43 4.9	8.815	6	4 25 48.91	2.1898	16 44 53.9	5.935
7	2 47 35.74	1.9963	10 51 52.6	8.774	7	4 28 0.43	2.1941	16 50 47.6	5.854
8	2 49 35.62	1.9998	11 0 37.8	8.733	8	4 30 12.20	2.1984	16 56 36.4	5.772
9	2 51 35.72	2.0034	11 9 20.5	8.691	9	4 32 24.23	2.2027	17 2 20.3	5.690
10	2 53 36.03	2.0070	11 18 0.7	8.648	10	4 34 36.52	2.2070	17 7 59.2	5.606
11	2 55 36.56	2.0107	11 26 38.3	8.604	11	4 36 49.07	2.2113	17 13 33.0	5.521
12	2 57 37.31	2.0144	11 35 13.2	8.559	12	4 39 1.88	2.2156	17 19 1.7	5.436
13	2 59 38.29	2.0182	11 43 45.4	8.514	13	4 41 14.95	2.2199	17 24 25.3	5.350
14	3 1 39.49	2.0219	11 52 14.9	8.468	14	4 43 28.27	2.2241	17 29 43.7	5.262
15	3 3 40.92	2.0257	12 0 41.6	8.421	15	4 45 41.84	2.2283	17 34 56.8	5.174
16	3 5 42.58	2.0296	12 9 5.4	8.374	16	4 47 55.66	2.2325	17 40 4.6	5.085
17	3 7 44.47	2.0334	12 17 26.4	8.326	17	4 50 9.74	2.2367	17 45 7.0	4.996
18	3 9 46.59	2.0373	12 25 44.5	8.277	18	4 52 24.07	2.2409	17 50 4.1	4.906
19	3 11 48.95	2.0412	12 33 59.6	8.226	19	4 54 38.65	2.2451	17 54 55.7	4.814
20	3 13 51.54	2.0452	12 42 11.6	8.175	20	4 56 53.48	2.2492	17 59 41.8	4.721
21	3 15 54.37	2.0492	12 50 20.6	8.123	21	4 59 8.55	2.2532	18 4 22.3	4.628
22	3 17 57.44	2.0532	12 58 26.4	8.070	22	5 1 23.87	2.2573	18 8 57.2	4.535
23	3 20 0.75	2.0572	N.13 6 29.0	8.017	23	5 3 39.43	2.2614	N.18 13 26.5	4.442
	SATURDAY 18.					**MONDAY 20.**			
0	3 22 4.30	2.0612	N.13 14 28.4	7.962	0	5 5 55.24	2.2655	N.18 17 50.2	4.346
1	3 24 8.10	2.0653	13 22 24.5	7.907	1	5 8 11.29	2.2694	18 22 8.1	4.249
2	3 26 12.14	2.0694	13 30 17.3	7.852	2	5 10 27.57	2.2733	18 26 20.1	4.152
3	3 28 16.43	2.0736	13 38 6.7	7.795	3	5 12 44.08	2.2772	18 30 26.3	4.054
4	3 30 20.97	2.0777	13 45 52.7	7.737	4	5 15 0.83	2.2811	18 34 26.6	3.956
5	3 32 25.75	2.0818	13 53 35.2	7.678	5	5 17 17.81	2.2850	18 38 21.0	3.857
6	3 34 30.78	2.0860	14 1 14.1	7.618	6	5 19 35.03	2.2888	18 42 9.5	3.757
7	3 36 36.07	2.0902	14 8 49.4	7.558	7	5 21 52.47	2.2926	18 45 51.9	3.656
8	3 38 41.61	2.0944	14 16 21.1	7.498	8	5 24 10.14	2.2963	18 49 28.2	3.554
9	3 40 47.40	2.0987	14 23 49.2	7.437	9	5 26 28.03	2.3000	18 52 58.4	3.452
10	3 42 53.45	2.1030	14 31 13.5	7.374	10	5 28 46.14	2.3036	18 56 22.5	3.350
11	3 44 59.76	2.1072	14 38 34.0	7.310	11	5 31 4.46	2.3072	18 59 40.4	3.247
12	3 47 6.32	2.1115	14 45 50.7	7.246	12	5 33 23.00	2.3107	19 2 52.1	3.142
13	3 49 13.14	2.1158	14 53 3.5	7.180	13	5 35 41.75	2.3142	19 5 57.5	3.037
14	3 51 20.22	2.1201	15 0 12.3	7.113	14	5 38 0.71	2.3177	19 8 56.5	2.931
15	3 53 27.55	2.1244	15 7 17.1	7.046	15	5 40 19.88	2.3212	19 11 49.2	2.825
16	3 55 35.15	2.1288	15 14 17.8	6.978	16	5 42 39.25	2.3245	19 14 35.5	2.718
17	3 57 43.01	2.1331	15 21 14.5	6.910	17	5 44 58.82	2.3278	19 17 15.3	2.610
18	3 59 51.12	2.1374	15 28 7.0	6.840	18	5 47 18.58	2.3310	19 19 48.7	2.502
19	4 1 59.49	2.1417	15 34 55.3	6.769	19	5 49 38.54	2.3342	19 22 15.6	2.393
20	4 4 8.13	2.1461	15 41 39.3	6.698	20	5 51 58.69	2.3374	19 24 35.9	2.283
21	4 6 17.03	2.1505	15 48 19.0	6.626	21	5 54 19.03	2.3406	19 26 49.6	2.173
22	4 8 26.19	2.1548	15 54 54.4	6.553	22	5 56 39.56	2.3436	19 28 56.7	2.063
23	4 10 35.61	2.1592	16 1 25.4	6.479	23	5 59 0.26	2.3465	19 30 57.2	1.952
24	4 12 45.30	2.1636	N.16 7 51.9	6.403	24	6 1 21.14	2.3495	N.19 32 51.0	1.841

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 1 21.14	2.3495	N.19 32 51.0	1.841
1	6 3 42.20	2.3524	19 34 38.1	1.728
2	6 6 3.43	2.3552	19 36 18.4	1.615
3	6 8 24.82	2.3579	19 37 51.9	1.502
4	6 10 46.37	2.3605	19 39 18.6	1.388
5	6 13 8.08	2.3632	19 40 38.4	1.273
6	6 15 29.95	2.3658	19 41 51.4	1.159
7	6 17 51.97	2.3683	19 42 57.5	1.044
8	6 20 14.14	2.3707	19 43 56.7	0.928
9	6 22 36.45	2.3730	19 44 48.9	0.812
10	6 24 58.90	2.3752	19 45 34.1	0.696
11	6 27 21.48	2.3775	19 46 12.4	0.580
12	6 29 44.20	2.3797	19 46 43.7	0.462
13	6 32 7.05	2.3818	19 47 7.9	0.344
14	6 34 30.02	2.3838	19 47 25.0	0.227
15	6 36 53.11	2.3857	19 47 35.1	+0.109
16	6 39 16.31	2.3876	19 47 38.1	−0.009
17	6 41 39.62	2.3894	19 47 34.0	0.128
18	6 44 3.04	2.3912	19 47 22.7	0.247
19	6 46 26.56	2.3928	19 47 4.3	0.367
20	6 48 50.18	2.3944	19 46 38.7	0.487
21	6 51 13.89	2.3959	19 46 5.9	0.606
22	6 53 37.69	2.3974	19 45 26.0	0.725
23	6 56 1.58	2.3988	N.19 44 38.9	0.845

WEDNESDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	6 58 25.55	2.4002	N.19 43 44.6	0.965
1	7 0 49.60	2.4014	19 42 43.1	1.085
2	7 3 13.72	2.4025	19 41 34.4	1.206
3	7 5 37.90	2.4035	19 40 18.4	1.327
4	7 8 2.14	2.4045	19 38 55.2	1.447
5	7 10 26.44	2.4055	19 37 24.8	1.567
6	7 12 50.80	2.4064	19 35 47.1	1.688
7	7 15 15.21	2.4072	19 34 2.2	1.808
8	7 17 39.66	2.4079	19 32 10.1	1.929
9	7 20 4.15	2.4085	19 30 10.7	2.050
10	7 22 28.68	2.4091	19 28 4.1	2.170
11	7 24 53.24	2.4097	19 25 50.3	2.291
12	7 27 17.84	2.4101	19 23 29.2	2.412
13	7 29 42.46	2.4104	19 21 0.9	2.532
14	7 32 7.09	2.4107	19 18 25.4	2.652
15	7 34 31.74	2.4109	19 15 42.7	2.772
16	7 36 56.40	2.4110	19 12 52.8	2.892
17	7 39 21.06	2.4111	19 9 55.7	3.011
18	7 41 45.73	2.4112	19 6 51.5	3.130
19	7 44 10.40	2.4111	19 3 40.1	3.250
20	7 46 35.06	2.4109	19 0 21.5	3.369
21	7 48 59.71	2.4107	18 56 55.8	3.487
22	7 51 24.34	2.4104	18 53 23.0	3.606
23	7 53 48.96	2.4101	18 49 43.1	3.724
24	7 56 13.56	2.4098	N.18 45 56.1	3.842

THURSDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	7 56 13.56	2.4098	N.18 45 56.1	3.842
1	7 58 38.14	2.4093	18 42 2.0	3.960
2	8 1 2.68	2.4088	18 38 0.9	4.077
3	8 3 27.19	2.4082	18 33 52.8	4.193
4	8 5 51.66	2.4075	18 29 37.7	4.310
5	8 8 16.09	2.4068	18 25 15.6	4.426
6	8 10 40.48	2.4061	18 20 46.6	4.542
7	8 13 4.82	2.4052	18 16 10.6	4.658
8	8 15 29.11	2.4043	18 11 27.7	4.772
9	8 17 53.34	2.4033	18 6 38.0	4.885
10	8 20 17.51	2.4023	18 1 41.5	4.998
11	8 22 41.62	2.4013	17 56 38.2	5.112
12	8 25 5.67	2.4002	17 51 28.1	5.225
13	8 27 29.65	2.3991	17 46 11.2	5.337
14	8 29 53.56	2.3979	17 40 47.6	5.448
15	8 32 17.39	2.3966	17 35 17.4	5.559
16	8 34 41.15	2.3952	17 29 40.5	5.670
17	8 37 4.82	2.3938	17 23 57.0	5.780
18	8 39 28.41	2.3924	17 18 6.9	5.889
19	8 41 51.91	2.3910	17 12 10.3	5.998
20	8 44 15.33	2.3896	17 6 7.2	6.106
21	8 46 38.66	2.3880	16 59 57.6	6.213
22	8 49 1.89	2.3863	16 53 41.6	6.319
23	8 51 25.02	2.3847	N.16 47 19.3	6.424

FRIDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	8 53 48.05	2.3830	N.16 40 50.7	6.529
1	8 56 10.98	2.3813	16 34 15.8	6.634
2	8 58 33.81	2.3796	16 27 34.6	6.738
3	9 0 56.53	2.3778	16 20 47.2	6.841
4	9 3 19.14	2.3759	16 13 53.7	6.943
5	9 5 41.64	2.3741	16 6 54.1	7.044
6	9 8 4.03	2.3722	15 59 48.4	7.145
7	9 10 26.31	2.3703	15 52 36.7	7.244
8	9 12 48.47	2.3683	15 45 19.1	7.343
9	9 15 10.51	2.3663	15 37 55.5	7.441
10	9 17 32.43	2.3643	15 30 26.1	7.538
11	9 19 54.23	2.3623	15 22 50.9	7.635
12	9 22 15.91	2.3603	15 15 9.9	7.731
13	9 24 37.47	2.3582	15 7 23.2	7.825
14	9 26 58.90	2.3561	14 59 30.9	7.918
15	9 29 20.20	2.3539	14 51 33.0	8.011
16	9 31 41.37	2.3518	14 43 29.5	8.103
17	9 34 2.42	2.3497	14 35 20.6	8.194
18	9 36 23.34	2.3476	14 27 6.2	8.285
19	9 38 44.13	2.3454	14 18 46.4	8.374
20	9 41 4.79	2.3433	14 10 21.3	8.462
21	9 43 25.32	2.3411	14 1 50.9	8.550
22	9 45 45.72	2.3388	13 53 15.3	8.636
23	9 48 5.98	2.3366	13 44 34.6	8.720
24	9 50 26.11	2.3344	N.13 35 48.9	8.804

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 50 26.11	2.3344	N.13 35 48.9	8.804
1	9 52 46.11	2.3322	13 26 58.1	8.888
2	9 55 5.97	2.3299	13 18 2.3	8.971
3	9 57 25.70	2.3277	13 9 1.6	9.052
4	9 59 45.30	2.3255	12 59 56.1	9.132
5	10 2 4.76	2.3232	12 50 45.7	9.212
6	10 4 24.09	2.3210	12 41 30.6	9.290
7	10 6 43.28	2.3188	12 32 10.9	9.367
8	10 9 2.34	2.3166	12 22 46.6	9.443
9	10 11 21.27	2.3143	12 13 17.7	9.519
10	10 13 40.06	2.3121	12 3 44.3	9.593
11	10 15 58.72	2.3099	11 54 6.6	9.665
12	10 18 17.25	2.3077	11 44 24.5	9.737
13	10 20 35.65	2.3055	11 34 38.1	9.808
14	10 22 53.91	2.3033	11 24 47.5	9.877
15	10 25 12.04	2.3011	11 14 52.8	9.946
16	10 27 30.04	2.2989	11 4 54.0	10.014
17	10 29 47.91	2.2968	10 54 51.1	10.082
18	10 32 5.66	2.2947	10 44 44.2	10.148
19	10 34 23.28	2.2926	10 34 33.4	10.212
20	10 36 40.77	2.2904	10 24 18.8	10.274
21	10 38 58.13	2.2883	10 14 0.5	10.336
22	10 41 15.37	2.2863	10 3 38.5	10.397
23	10 43 32.49	2.2843	N. 9 53 12.8	10.457

SUNDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 45 49.49	2.2822	N. 9 42 43.6	10.516
1	10 48 6.36	2.2802	9 32 10.9	10.574
2	10 50 23.12	2.2783	9 21 34.7	10.631
3	10 52 39.76	2.2763	9 10 55.2	10.686
4	10 54 56.28	2.2744	9 0 12.4	10.740
5	10 57 12.69	2.2725	8 49 26.4	10.793
6	10 59 28.98	2.2706	8 38 37.2	10.846
7	11 1 45.16	2.2687	8 27 44.9	10.897
8	11 4 1.23	2.2669	8 16 49.6	10.947
9	11 6 17.19	2.2652	8 5 51.3	10.996
10	11 8 33.05	2.2634	7 54 50.1	11.042
11	11 10 48.80	2.2617	7 43 46.2	11.088
12	11 13 4.45	2.2600	7 32 39.5	11.134
13	11 15 20.00	2.2583	7 21 30.1	11.178
14	11 17 35.45	2.2567	7 10 18.1	11.222
15	11 19 50.80	2.2551	6 59 3.5	11.263
16	11 22 6.06	2.2536	6 47 46.5	11.303
17	11 24 21.23	2.2520	6 36 27.1	11.343
18	11 26 36.30	2.2505	6 25 5.3	11.382
19	11 28 51.29	2.2491	6 13 41.3	11.419
20	11 31 6.19	2.2476	6 2 15.1	11.455
21	11 33 21.00	2.2462	5 50 46.7	11.490
22	11 35 35.73	2.2449	5 39 16.3	11.524
23	11 37 50.38	2.2436	5 27 43.9	11.557
24	11 40 4.96	2.2423	N. 5 16 9.5	11.588

MONDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 40 4.96	2.2423	N. 5 16 9.5	11.588
1	11 42 19.46	2.2411	5 4 33.3	11.617
2	11 44 33.89	2.2399	4 52 55.4	11.646
3	11 46 48.25	2.2388	4 41 15.8	11.674
4	11 49 2.54	2.2377	4 29 34.5	11.702
5	11 51 16.77	2.2366	4 17 51.6	11.728
6	11 53 30.93	2.2355	4 6 7.2	11.752
7	11 55 45.03	2.2346	3 54 21.4	11.774
8	11 57 59.08	2.2337	3 42 34.3	11.796
9	12 0 13.07	2.2328	3 30 45.9	11.817
10	12 2 27.01	2.2319	3 18 56.3	11.837
11	12 4 40.90	2.2311	3 7 5.5	11.856
12	12 6 54.75	2.2304	2 55 13.6	11.873
13	12 9 8.55	2.2297	2 43 20.7	11.889
14	12 11 22.31	2.2290	2 31 26.9	11.904
15	12 13 36.03	2.2284	2 19 32.2	11.918
16	12 15 49.72	2.2278	2 7 36.7	11.931
17	12 18 3.37	2.2272	1 55 40.5	11.942
18	12 20 16.99	2.2267	1 43 43.7	11.952
19	12 22 30.58	2.2263	1 31 46.3	11.962
20	12 24 44.15	2.2259	1 19 48.3	11.970
21	12 26 57.69	2.2256	1 7 49.9	11.977
22	12 29 11.22	2.2253	0 55 51.1	11.982
23	12 31 24.73	2.2250	N. 0 43 52.0	11.987

TUESDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 33 38.22	2.2248	N. 0 31 52.6	11.991
1	12 35 51.70	2.2247	0 19 53.1	11.993
2	12 38 5.18	2.2246	N. 0 7 53.5	11.993
3	12 40 18.65	2.2244	S. 0 4 6.1	11.993
4	12 42 32.11	2.2244	0 16 5.7	11.992
5	12 44 45.58	2.2245	0 28 5.2	11.990
6	12 46 59.05	2.2246	0 40 4.5	11.967
7	12 49 12.53	2.2247	0 52 3.6	11.982
8	12 51 26.01	2.2248	1 4 2.3	11.975
9	12 53 39.50	2.2250	1 16 0.6	11.968
10	12 55 53.01	2.2252	1 27 58.5	11.960
11	12 58 6.53	2.2255	1 39 55.8	11.950
12	13 0 20.07	2.2259	1 51 52.5	11.939
13	13 2 33.64	2.2263	2 3 48.5	11.927
14	13 4 47.23	2.2267	2 15 43.8	11.915
15	13 7 0.84	2.2271	2 27 38.3	11.901
16	13 9 14.48	2.2276	2 39 31.9	11.886
17	13 11 28.16	2.2282	2 51 24.6	11.869
18	13 13 41.87	2.2288	3 3 16.2	11.851
19	13 15 55.62	2.2295	3 15 6.7	11.832
20	13 18 9.41	2.2302	3 26 56.1	11.812
21	13 20 23.25	2.2310	3 38 44.2	11.791
22	13 22 37.13	2.2318	3 50 31.0	11.768
23	13 24 51.06	2.2326	4 2 16.4	11.745
24	13 27 5.04	2.2334	S. 4 14 0.4	11.721

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 27 5.04	2.2334	S. 4 14 0.4	11.721
1	13 29 19.07	2.2343	4 25 42.9	11.695
2	13 31 33.16	2.2353	4 37 23.8	11.667
3	13 33 47.31	2.2363	4 49 3.0	11.639
4	13 36 1.52	2.2373	5 0 40.5	11.611
5	13 38 15.79	2.2383	5 12 16.3	11.581
6	13 40 30.12	2.2394	5 23 50.2	11.548
7	13 42 44.52	2.2407	5 35 22.1	11.515
8	13 44 59.00	2.2419	5 46 52.0	11.482
9	13 47 13.55	2.2431	5 58 19.9	11.447
10	13 49 28.17	2.2444	6 9 45.7	11.412
11	13 51 42.87	2.2457	6 21 9.3	11.374
12	13 53 57.65	2.2470	6 32 30.6	11.335
13	13 56 12.51	2.2483	6 43 49.5	11.295
14	13 58 27.45	2.2497	6 55 6.0	11.256
15	14 0 42.48	2.2512	7 6 20.1	11.213
16	14 2 57.60	2.2527	7 17 31.6	11.170
17	14 5 12.81	2.2542	7 28 40.5	11.126
18	14 7 28.10	2.2557	7 39 46.7	11.080
19	14 9 43.49	2.2572	7 50 50.1	11.034
20	14 11 58.97	2.2588	8 1 50.7	10.987
21	14 14 14.55	2.2605	8 12 48.5	10.938
22	14 16 30.23	2.2622	8 23 43.3	10.888
23	14 18 46.01	2.2638	S. 8 34 35.1	10.837

THURSDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 21 1.89	2.2656	S. 8 45 23.8	10.785
1	14 23 17.88	2.2673	8 56 9.3	10.732
2	14 25 33.97	2.2690	9 6 51.6	10.677
3	14 27 50.16	2.2708	9 17 30.6	10.622
4	14 30 6.46	2.2726	9 28 6.3	10.566
5	14 32 22.87	2.2744	9 38 38.5	10.508
6	14 34 39.39	2.2763	9 49 7.2	10.449
7	14 36 56.02	2.2782	9 59 32.4	10.389
8	14 39 12.77	2.2801	10 9 53.9	10.328
9	14 41 29.63	2.2819	10 20 11.7	10.266
10	14 43 46.60	2.2838	10 30 25.8	10.203
11	14 46 3.69	2.2858	10 40 36.1	10.139
12	14 48 20.90	2.2878	10 50 42.5	10.074
13	14 50 38.23	2.2897	11 0 45.0	10.008
14	14 52 55.67	2.2917	11 10 43.5	9.940
15	14 55 13.23	2.2937	11 20 37.8	9.871
16	14 57 30.91	2.2957	11 30 28.0	9.802
17	14 59 48.72	2.2978	11 40 14.0	9.732
18	15 2 6.65	2.2998	11 49 55.8	9.660
19	15 4 24.70	2.3018	11 59 33.2	9.587
20	15 6 42.87	2.3038	12 9 6.2	9.513
21	15 9 1.16	2.3058	12 18 31.8	9.439
22	15 11 19.57	2.3079	12 27 58.9	9.363
23	15 13 38.11	2.3100	12 37 18.4	9.287
24	15 15 56.77	2.3120	S. 12 46 33.3	9.209

FRIDAY, JULY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 15 56.77	2.3120	S. 12 46 33.3	9.209

PHASES OF THE MOON.

		d	h	m
○ Full Moon . .	June	5	10	38.1
☾ Last Quarter. . . .		13	1	34.8
● New Moon		20	22	52.8
☽ First Quarter . . .		27	22	1.1

		d	h
☾ Perigee	June	1	23.5
☾ Apogee		14	0.0
☾ Perigee		27	19.2

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Sun	W.	120° 11′ 15″	2533	121° 51′ 42″	2530	123° 32′ 13″	2528	125° 12′ 47″	2526
	Saturn	W.	80 39 2	2251	82 26 13	2248	84 13 29	2245	86 0 49	2243
	Venus	W.	79 1 54	2585	80 41 10	2580	82 20 32	2577	83 59 59	2574
	Pollux	W.	78 53 9	2272	80 39 50	2268	82 26 37	2264	84 13 29	2261
	Regulus	W.	42 43 47	2214	44 31 54	2210	46 20 6	2207	48 8 23	2204
	Antares	E.	57 51 17	2298	56 5 14	2298	54 19 12	2299	52 33 11	2301
	α Aquilæ	E.	104 45 56	2764	103 10 41	2753	101 35 12	2743	99 59 29	2735
2	Saturn	W.	94 58 15	2235	96 45 50	2235	98 33 26	2235	100 21 2	2235
	Pollux	W.	93 8 42	2254	94 55 50	2253	96 42 59	2254	98 30 7	2254
	Venus	W.	92 18 6	2564	93 57 51	2563	95 37 37	2563	97 17 23	2564
	Regulus	W.	57 10 34	2197	58 59 6	2196	60 47 39	2196	62 36 12	2196
	Antares	E.	43 44 17	2326	41 58 55	2335	40 13 46	2345	38 28 52	2358
	α Aquilæ	E.	91 58 42	2712	90 22 18	2711	88 45 53	2712	87 9 29	2714
3	Regulus	W.	71 38 38	2205	73 26 58	2208	75 15 14	2210	77 3 26	2214
	Spica	W.	18 55 23	2459	20 37 34	2421	22 20 39	2394	24 4 22	2374
	α Aquilæ	E.	79 8 46	2745	77 33 6	2755	75 57 39	2767	74 22 28	2781
4	Regulus	W.	86 2 48	2240	87 50 16	2247	89 37 34	2253	91 24 42	2260
	Spica	W.	32 48 10	2331	34 33 25	2329	36 18 42	2330	38 3 58	2332
	Jupiter	W.	28 1 31	2253	29 48 40	2256	31 35 44	2260	33 22 42	2266
	α Aquilæ	E.	66 31 49	2877	64 59 1	2903	63 26 46	2931	61 55 6	2961
	Fomalhaut	E.	99 12 27	2519	97 31 40	2523	95 50 59	2528	94 10 25	2534
5	Regulus	W.	100 17 28	2304	102 3 22	2314	103 49 1	2324	105 34 26	2335
	Spica	W.	46 49 12	2355	48 33 52	2362	50 18 21	2370	52 2 39	2378
	Jupiter	W.	42 15 14	2303	44 1 9	2312	45 46 51	2321	47 32 20	2331
	α Aquilæ	E.	54 27 27	3159	53 0 29	3209	51 34 31	3265	50 9 39	3326
	Fomalhaut	E.	85 50 6	2579	84 10 42	2590	82 31 33	2602	80 52 41	2616
	α Pegasi	E.	100 50 28	2640	99 12 28	2647	97 34 37	2655	95 56 57	2664
6	Spica	W.	60 40 49	2429	62 23 42	2441	64 6 19	2453	65 48 38	2465
	Jupiter	W.	56 15 54	2388	57 59 46	2400	59 43 21	2413	61 26 37	2426
	Fomalhaut	E.	72 43 20	2696	71 6 35	2715	69 30 15	2735	67 54 22	2756
	α Pegasi	E.	87 51 55	2721	86 15 43	2735	84 39 49	2750	83 4 15	2766
7	Spica	W.	74 15 43	2532	75 56 12	2546	77 36 21	2561	79 16 10	2575
	Jupiter	W.	69 58 13	2495	71 39 33	2510	73 20 33	2524	75 1 13	2539
	Antares	W.	29 17 16	2746	30 52 55	2738	32 28 45	2733	34 4 41	2731
	Fomalhaut	E.	60 2 21	2878	58 29 34	2907	56 57 24	2937	55 25 52	2968
	α Pegasi	E.	75 11 58	2856	73 38 43	2877	72 5 55	2899	70 33 35	2922
8	Spica	W.	87 30 12	2650	89 7 59	2665	90 45 26	2681	92 22 32	2695
	Jupiter	W.	83 19 21	2615	84 57 56	2629	86 36 11	2645	88 14 5	2660
	Antares	W.	42 4 3	2750	43 39 36	2759	45 14 58	2767	46 50 9	2776
	Fomalhaut	E.	47 58 44	3154	46 31 40	3199	45 5 30	3248	43 40 18	3300
	α Pegasi	E.	62 59 27	3049	61 30 15	3078	60 1 39	3108	58 33 39	3139
	α Arietis	E.	105 39 37	2780	104 4 43	2793	102 30 6	2807	100 55 47	2821
9	Spica	W.	100 23 0	2771	101 58 6	2786	103 32 52	2801	105 7 18	2816
	Jupiter	W.	96 18 29	2735	97 54 22	2750	99 29 55	2765	101 5 9	2779

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Sun	W.	126° 53′ 24″	2525	128° 34′ 3″	2523	130° 14′ 44″	2523	131° 55′ 25″	2523
	Saturn	W.	87 48 12	2241	89 35 39	2239	91 23 9	2237	93 10 41	2236
	Venus	W.	85 39 30	2571	87 19 5	2569	88 58 43	2567	90 38 23	2565
	Pollux	W.	86 0 26	2259	87 47 26	2257	89 34 29	2255	91 21 35	2254
	Regulus	W.	49 56 44	2202	51 45 8	2201	53 33 34	2199	55 22 3	2198
	Antares	E.	50 47 13	2304	49 1 19	2308	47 15 31	2313	45 29 50	2318
	α Aquilæ	E.	98 23 35	2728	96 47 32	2722	95 11 21	2717	93 35 4	2713
2	Saturn	W.	102 8 37	2236	103 56 11	2237	105 43 43	2239	107 31 13	2241
	Pollux	W.	100 17 14	2256	102 4 19	2258	103 51 21	2260	105 38 19	2263
	Venus	W.	98 57 8	2564	100 36 53	2565	102 16 36	2566	103 56 17	2569
	Regulus	W.	64 24 45	2197	66 13 17	2198	68 1 47	2200	69 50 14	2202
	Antares	E.	36 44 17	2373	35 0 4	2391	33 16 16	2411	31 32 57	2436
	α Aquilæ	E.	85 33 8	2718	83 56 52	2722	82 20 42	2728	80 44 39	2735
3	Regulus	W.	78 51 33	2218	80 39 33	2223	82 27 26	2229	84 15 11	2234
	Spica	W.	25 48 34	2359	27 33 8	2348	29 17 58	2339	31 3 0	2334
	α Aquilæ	E.	72 47 35	2796	71 13 2	2814	69 38 52	2833	68 5 7	2854
4	Regulus	W.	93 11 40	2268	94 58 26	2277	96 44 59	2285	98 31 20	2294
	Spica	W.	39 49 11	2334	41 34 21	2337	43 19 26	2342	45 4 24	2348
	Jupiter	W.	35 9 32	2271	36 56 14	2278	38 42 46	2286	40 29 6	2294
	α Aquilæ	E.	60 24 4	2994	58 53 44	3030	57 24 9	3069	55 55 22	3112
	Fomalhaut	E.	92 29 59	2541	90 49 43	2549	89 9 38	2558	87 29 45	2568
5	Regulus	W.	107 19 35	2346	109 4 28	2357	110 49 4	2369	112 33 23	2381
	Spica	W.	53 46 45	2387	55 30 38	2397	57 14 17	2408	58 57 41	2419
	Jupiter	W.	49 17 35	2342	51 2 34	2353	52 47 17	2364	54 31 44	2375
	α Aquilæ	E.	48 45 58	3392	47 23 32	3464	46 2 28	3545	44 42 53	3634
	Fomalhaut	E.	79 14 8	2630	77 35 54	2646	75 58 1	2661	74 20 29	2678
	α Pegasi	E.	94 19 29	2673	92 42 13	2684	91 5 11	2695	89 28 25	2707
6	Spica	W.	67 30 40	2478	69 12 24	2492	70 53 49	2505	72 34 55	2518
	Jupiter	W.	63 9 35	2439	64 52 14	2453	66 34 33	2467	68 16 33	2481
	Fomalhaut	E.	66 18 57	2779	64 44 1	2802	63 9 36	2826	61 35 42	2852
	α Pegasi	E.	81 29 2	2782	79 54 11	2800	78 19 43	2818	76 45 38	2837
7	Spica	W.	80 55 39	2590	82 34 48	2605	84 13 36	2620	85 52 4	2635
	Jupiter	W.	76 41 32	2554	78 21 30	2569	80 1 8	2584	81 40 25	2599
	Antares	W.	35 40 40	2732	37 16 38	2735	38 52 32	2738	40 28 21	2744
	Fomalhaut	E.	53 54 59	3001	52 24 48	3036	50 55 20	3073	49 26 38	3113
	α Pegasi	E.	69 1 44	2946	67 30 23	2969	65 59 32	2995	64 29 13	3022
8	Spica	W.	93 59 18	2710	95 35 44	2726	97 11 49	2741	98 47 34	2756
	Jupiter	W.	89 51 38	2675	91 28 51	2690	93 5 44	2706	94 42 16	2720
	Antares	W.	48 25 8	2786	49 59 54	2796	51 34 27	2807	53 8 46	2818
	Fomalhaut	E.	42 16 7	3336	40 53 0	3415	39 31 1	3482	38 10 17	3554
	α Pegasi	E.	57 6 17	3173	55 39 35	3207	54 13 34	3242	52 48 15	3280
	α Arietis	E.	99 21 46	2834	97 48 2	2848	96 14 36	2862	94 41 29	2876
9	Spica	W.	106 41 25	2831	108 15 13	2845	109 48 43	2859	111 21 54	2873
	Jupiter	W.	102 40 4	2794	104 14 40	2808	105 48 58	2821	107 22 59	2835

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
9	Antares	W.	54° 42′ 50″	2829	56° 16′ 40″	2841	57° 50′ 15″	2852	59° 23′ 35″	2864
	Fomalhaut	E.	36 50 52	3633	35 32 53	3720	34 16 27	3816	33 1 41	3924
	α Pegasi	E.	51 23 40	3390	49 59 52	3363	48 36 53	3408	47 14 45	3456
	α Arietis	E.	93 8 40	2891	91 36 9	2905	90 3 57	2920	88 32 3	2934
	Sun	E.	135 39 17	3110	134 11 19	3124	132 43 38	3138	131 16 14	3152
10	Antares	W.	67 6 30	2923	68 38 20	2934	70 9 56	2945	71 41 18	2956
	α Aquilæ	W.	32 9 32	5709	32 57 53	5480	33 48 51	5279	34 42 14	5103
	α Arietis	E.	80 57 6	3006	79 27 1	3021	77 57 14	3035	76 27 45	3049
	Sun	E.	124 3 28	3220	122 37 43	3234	121 12 14	3247	119 47 1	3260
11	Antares	W.	79 14 44	3008	80 44 47	3018	82 14 38	3027	83 44 17	3036
	α Aquilæ	W.	39 38 33	4492	40 42 32	4408	41 47 46	4333	42 54 8	4265
	α Arietis	E.	69 4 41	3120	67 36 56	3134	66 9 28	3148	64 42 17	3162
	Sun	E.	112 44 31	3319	111 20 41	3329	109 57 3	3339	108 33 37	3350
12	Antares	W.	91 9 54	3076	92 38 33	3083	94 7 3	3089	95 35 26	3096
	α Aquilæ	W.	48 39 51	4017	49 51 14	3979	51 3 14	3946	52 15 47	3916
	α Arietis	E.	57 30 30	3232	56 4 59	3247	54 39 45	3262	53 14 49	3276
	Sun	E.	101 39 8	3392	100 16 42	3400	98 54 25	3406	97 32 15	3412
13	Antares	W.	102 55 36	3120	104 23 21	3124	105 51 1	3128	107 18 37	3130
	α Aquilæ	W.	58 25 32	3795	59 40 39	3776	60 56 6	3758	62 11 52	3742
	α Arietis	E.	46 14 40	3359	44 51 37	3379	43 28 56	3400	42 6 39	3421
	Sun	E.	90 42 58	3435	89 21 21	3438	87 59 48	3441	86 38 18	3444
14	α Aquilæ	W.	68 34 46	3671	69 52 4	3659	71 9 35	3647	72 27 19	3635
	Fomalhaut	W.	34 53 25	3997	36 5 8	3931	37 17 56	3873	38 31 43	3820
	α Pegasi	W.	25 25 17	5997	26 10 32	5685	26 59 9	5418	27 50 51	5189
	Sun	E.	79 51 14	3446	78 29 50	3446	77 8 25	3444	75 46 58	3442
15	α Aquilæ	W.	78 58 53	3585	80 17 44	3576	81 36 45	3566	82 55 56	3558
	Fomalhaut	W.	44 52 52	3616	46 11 9	3584	47 30 1	3554	48 49 25	3525
	α Pegasi	W.	32 46 55	4405	33 52 12	4297	34 59 7	4202	36 7 31	4116
	Sun	E.	68 59 2	3426	67 37 15	3421	66 15 22	3415	64 53 23	3410
16	α Aquilæ	W.	89 34 8	3518	90 54 12	3511	92 14 24	3504	93 34 44	3497
	Fomalhaut	W.	55 33 49	3404	56 56 1	3382	58 18 38	3362	59 41 38	3343
	α Pegasi	W.	42 8 6	3789	43 23 20	3738	44 39 27	3692	45 56 23	3648
	Sun	E.	58 1 45	3376	56 39 1	3368	55 16 8	3360	53 53 6	3352
17	Fomalhaut	W.	66 42 7	3251	68 7 16	3234	69 32 45	3218	70 58 33	3202
	α Pegasi	W.	52 31 53	3467	53 52 54	3436	55 14 30	3407	56 36 39	3379
	Sun	E.	46 55 23	3305	45 31 17	3295	44 7 0	3285	42 42 31	3274
18	Fomalhaut	W.	78 12 17	3124	79 39 57	3110	81 7 54	3096	82 36 9	3082
	α Pegasi	W.	63 34 54	3256	64 59 57	3234	66 25 26	3213	67 51 20	3193
	Sun	E.	35 37 0	3222	34 11 17	3212	32 45 22	3202	31 19 15	3192
22	Sun	W.	13 23 40	2972	14 54 28	2926	16 26 14	2891	17 58 45	2862
	Regulus	E.	44 37 32	2475	42 55 43	2465	41 13 41	2457	39 31 27	2448
	Spica	E.	98 23 33	2504	96 42 25	2494	95 1 4	2485	93 19 30	2476

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
9	Antares	W.	60° 56′ 40″	2876	62° 29′ 30″	2887	64° 2′ 5″	2899	65° 34′ 25″	2911
	Fomalhaut	E.	31 48 46	4045	30 37 51	4182	29 29 8	4338	28 22 50	4516
	α Pegasi	E.	45 53 32	3507	44 33 16	3562	43 14 0	3620	41 55 47	3683
	α Arietis	E.	87 0 27	2948	85 29 9	2963	83 58 10	2977	82 27 29	2992
	Sun	E.	129 49 7	3166	128 22 17	3180	126 55 44	3194	125 29 28	3208
10	Antares	W.	73 12 26	2967	74 43 20	2977	76 14 1	2988	77 44 29	2998
	α Aquilæ	W.	35 37 49	4949	36 35 25	4812	37 34 51	4692	38 35 57	4587
	α Arietis	E.	74 58 33	3064	73 29 39	3078	72 1 2	3092	70 32 43	3106
	Sun	E.	118 22 3	3272	116 57 19	3285	115 32 50	3296	114 8 34	3307
11	Antares	W.	85 13 45	3045	86 43 2	3053	88 12 9	3061	89 41 6	3069
	α Aquilæ	W.	44 1 33	4205	45 9 54	4151	46 19 7	4102	47 29 7	4056
	α Arietis	E.	63 15 22	3176	61 48 44	3190	60 22 23	3204	58 56 18	3218
	Sun	E.	107 10 23	3359	105 47 20	3368	104 24 27	3376	103 1 43	3384
12	Antares	W.	97 3 41	3101	98 31 49	3106	99 59 51	3112	101 27 46	3116
	α Aquilæ	W.	53 28 51	3887	54 42 24	3861	55 56 23	3838	57 10 46	3816
	α Arietis	E.	51 50 10	3292	50 25 49	3308	49 1 47	3325	47 38 4	3341
	Sun	E.	96 10 12	3417	94 48 15	3423	93 26 24	3428	92 4 39	3431
13	Antares	W.	108 46 10	3133	110 13 39	3136	111 41 5	3138	113 8 29	3139
	α Aquilæ	W.	63 27 55	3726	64 44 15	3710	66 0 51	3697	67 17 41	3683
	α Arietis	E.	40 44 46	3444	39 23 19	3470	38 2 21	3498	36 41 55	3530
	Sun	E.	85 16 51	3446	83 55 26	3446	82 34 2	3446	81 12 38	3446
14	α Aquilæ	W.	73 45 16	3624	75 3 24	3614	76 21 43	3604	77 40 13	3595
	Fomalhaut	W.	39 46 24	3772	41 1 55	3728	42 18 12	3688	43 35 12	3650
	α Pegasi	W.	28 45 21	4989	29 42 25	4814	30 41 50	4659	31 43 24	4524
	Sun	E.	74 25 29	3439	73 3 57	3437	71 42 22	3434	70 20 44	3431
15	α Aquilæ	W.	84 15 16	3550	85 34 45	3541	86 54 24	3533	88 14 12	3525
	Fomalhaut	W.	50 9 21	3498	51 29 47	3473	52 50 41	3449	54 12 2	3426
	α Pegasi	W.	37 17 17	4038	38 28 19	3967	39 40 31	3903	40 53 48	3843
	Sun	E.	63 31 18	3404	62 9 6	3398	60 46 47	3391	59 24 20	3384
16	α Aquilæ	W.	94 55 11	3492	96 15 44	3486	97 36 24	3479	98 57 11	3474
	Fomalhaut	W.	61 5 0	3324	62 28 44	3305	63 52 50	3286	65 17 18	3268
	α Pegasi	W.	47 14 6	3608	48 32 32	3569	49 51 40	3533	51 11 28	3499
	Sun	E.	52 29 55	3343	51 6 33	3334	49 43 1	3325	48 19 18	3314
17	Fomalhaut	W.	72 24 40	3186	73 51 6	3170	75 17 51	3154	76 44 55	3139
	α Pegasi	W.	57 59 19	3352	59 22 30	3327	60 46 10	3303	62 10 18	3279
	Sun	E.	41 17 49	3264	39 52 55	3253	38 27 49	3243	37 2 31	3232
18	Fomalhaut	W.	84 4 41	3069	85 33 29	3055	87 2 34	3042	88 31 55	3030
	α Pegasi	W.	69 17 38	3173	70 44 20	3153	72 11 25	3134	73 38 53	3117
	Sun	E.	29 52 56	3183	28 26 26	3173	26 59 45	3166	25 32 55	3158
22	Sun	W.	19 31 52	2839	21 5 29	2818	22 39 33	2801	24 14 0	2785
	Regulus	E.	37 49 0	2439	36 6 21	2431	34 23 30	2423	32 40 28	2414
	Spica	E.	91 37 43	2467	89 55 44	2459	88 13 33	2452	86 31 12	2444

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
22	Jupiter	E.	102 16 22	2482	100 34 43	2472	98 52 51	2464	97 10 47	2455
23	Sun	W.	25 48 48	2770	27 23 55	2756	28 59 20	2745	30 35 0	2734
	Regulus	E.	30 57 14	2407	29 13 49	2400	27 30 14	2393	25 46 30	2387
	Spica	E.	84 48 40	2436	83 5 57	2429	81 23 4	2422	79 40 1	2416
	Jupiter	E.	88 37 26	2415	86 54 13	2408	85 10 50	2401	83 27 17	2394
24	Sun	W.	38 36 45	2689	40 13 40	2681	41 50 45	2674	43 28 0	2667
	Saturn	W.	18 15 44	2431	19 58 34	2420	21 41 40	2411	23 24 59	2403
	Spica	E.	71 2 38	2389	69 18 47	2384	67 34 49	2380	65 50 45	2375
	Jupiter	E.	74 47 15	2366	73 2 51	2360	71 18 19	2355	69 33 40	2351
	Antares	E.	116 49 7	2429	115 6 14	2422	113 23 11	2415	111 39 58	2408
25	Sun	W.	51 36 16	2640	53 14 16	2635	54 52 23	2632	56 30 35	2628
	Saturn	W.	32 4 12	2371	33 48 28	2367	35 32 50	2363	37 17 18	2359
	Spica	E.	57 9 12	2362	55 24 43	2360	53 40 11	2359	51 55 37	2358
	Jupiter	E.	60 48 57	2332	59 3 44	2329	57 18 27	2327	55 33 7	2324
	Antares	E.	103 1 43	2382	101 17 43	2378	99 33 36	2373	97 49 23	2370
26	Sun	W.	64 42 48	2612	66 21 27	2610	68 0 9	2607	69 38 54	2605
	Saturn	W.	46 0 57	2343	47 45 54	2341	49 30 54	2339	51 15 57	2337
	Venus	W.	20 5 11	2650	21 42 58	2645	23 20 52	2640	24 58 52	2637
	Spica	E.	43 12 44	2362	41 28 14	2365	39 43 49	2368	37 59 29	2373
	Jupiter	E.	46 45 38	2316	45 0 2	2315	43 14 24	2314	41 28 45	2314
	Antares	E.	89 7 11	2357	87 22 34	2355	85 37 55	2353	83 53 13	2352
27	Sun	W.	77 53 17	2598	79 32 15	2596	81 11 15	2596	82 50 16	2596
	Saturn	W.	60 1 50	2330	61 47 6	2329	63 32 23	2328	65 17 42	2328
	Venus	W.	33 9 57	2624	34 48 19	2622	36 26 44	2621	38 5 11	2620
	Regulus	W.	25 10 57	2286	26 57 17	2285	28 43 38	2285	30 29 59	2285
	Jupiter	E.	32 40 38	2320	30 55 7	2322	29 9 39	2324	27 24 15	2328
	Antares	E.	75 9 25	2350	73 24 39	2350	71 39 53	2352	69 55 9	2353
28	Sun	W.	91 5 26	2594	92 44 29	2595	94 23 31	2596	96 2 32	2596
	Saturn	W.	74 4 22	2327	75 49 42	2328	77 35 1	2328	79 20 20	2328
	Venus	W.	46 17 42	2617	47 56 14	2617	49 34 46	2617	51 13 18	2617
	Regulus	W.	39 21 51	2285	41 8 13	2285	42 54 35	2285	44 40 56	2286
	Antares	E.	61 12 1	2363	59 27 34	2366	57 43 11	2371	55 58 54	2375
29	Sun	W.	104 17 18	2602	105 56 10	2604	107 35 0	2606	109 13 47	2608
	Saturn	W.	88 6 35	2334	89 51 45	2335	91 36 53	2337	93 21 58	2339
	Venus	W.	59 25 49	2621	61 4 16	2622	62 42 41	2624	64 21 3	2626
	Regulus	W.	53 32 22	2291	55 18 34	2293	57 4 44	2295	58 50 51	2296
	Antares	E.	47 19 18	2405	45 35 51	2414	43 52 37	2425	42 9 38	2436
	α Aquilæ	E.	95 7 30	2813	93 33 19	2814	91 59 9	2815	90 25 0	2816
30	Sun	W.	117 26 55	2621	119 5 22	2624	120 43 44	2628	122 22 1	2632
	Saturn	W.	102 6 39	2351	103 51 24	2354	105 36 5	2357	107 20 41	2360
	Venus	W.	72 32 16	2637	74 10 21	2639	75 48 23	2642	77 26 21	2646
	Regulus	W.	67 40 43	2308	69 26 31	2311	71 12 14	2314	72 57 53	2317
	Antares	E.	33 39 17	2517	31 58 28	2542	30 18 13	2571	28 38 38	2604
	α Aquilæ	E.	82 35 11	2839	81 1 34	2848	79 28 8	2857	77 54 54	2868

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
22	JUPITER	E.	95° 28′ 30″	2446	93° 46′ 1″	2438	92° 3′ 21″	2430	90° 20′ 29″	2422
23	SUN	W.	32 10 55	2723	33 47 4	2713	35 23 26	2704	37 0 0	2696
	Regulus	E.	24 2 36	2380	22 18 33	2373	20 34 20	2367	18 49 58	2362
	Spica	E.	77 56 49	2410	76 13 28	2404	74 29 59	2398	72 46 22	2394
	JUPITER	E.	81 43 34	2388	79 59 42	2382	78 15 41	2376	76 31 32	2371
24	SUN	W.	45 5 24	2661	46 42 56	2656	48 20 35	2650	49 58 22	2645
	SATURN	W.	25 8 30	2395	26 52 12	2388	28 36 4	2382	30 20 4	2377
	Spica	E.	64 6 35	2372	62 22 20	2369	60 38 1	2366	58 53 38	2364
	JUPITER	E.	67 48 55	2347	66 4 4	2343	64 19 7	2339	62 34 5	2335
	Antares	E.	109 56 35	2402	108 13 3	2396	106 29 23	2391	104 45 36	2387
25	SUN	W.	58 8 52	2624	59 47 14	2621	61 25 41	2617	63 4 13	2615
	SATURN	W.	39 1 52	2355	40 46 32	2352	42 31 16	2349	44 16 4	2346
	Spica	E.	50 11 2	2358	48 26 27	2358	46 41 52	2358	44 57 17	2359
	JUPITER	E.	53 47 43	2322	52 2 16	2320	50 16 46	2318	48 31 13	2317
	Antares	E.	96 5 5	2367	94 20 43	2364	92 36 16	2361	90 51 45	2359
26	SUN	W.	71 17 42	2604	72 56 32	2602	74 35 25	2600	76 14 20	2599
	SATURN	W.	53 1 3	2335	54 46 12	2333	56 31 23	2332	58 16 36	2331
	VENUS	W.	26 36 57	2633	28 15 7	2630	29 53 21	2628	31 31 38	2626
	Spica	E.	36 15 15	2378	34 31 9	2386	32 47 13	2394	31 3 29	2405
	JUPITER	E.	39 43 6	2314	37 57 27	2315	36 11 49	2315	34 26 12	2317
	Antares	E.	82 8 29	2351	80 23 44	2350	78 38 58	2350	76 54 12	2350
27	SUN	W.	84 29 17	2596	86 8 18	2595	87 47 20	2594	89 26 23	2594
	SATURN	W.	67 3 1	2327	68 48 21	2327	70 33 41	2326	72 19 2	2327
	VENUS	W.	39 43 30	2618	41 22 9	2618	43 0 40	2618	44 39 11	2618
	Regulus	W.	32 16 20	2285	34 2 42	2284	35 49 5	2284	37 35 28	2284
	JUPITER	E.	25 38 57	2334	23 53 47	2341	22 8 47	2350	20 24 0	2362
	Antares	E.	68 10 26	2354	66 25 45	2356	64 41 7	2358	62 56 32	2361
28	SUN	W.	97 41 32	2597	99 20 31	2599	100 59 28	2599	102 38 24	2601
	SATURN	W.	81 5 38	2329	82 50 55	2331	84 36 10	2332	86 21 23	2333
	VENUS	W.	52 51 50	2618	54 30 21	2618	56 8 51	2619	57 47 20	2619
	Regulus	W.	46 27 16	2287	48 13 35	2288	49 59 52	2289	51 46 8	2290
	Antares	E.	54 14 43	2380	52 30 39	2385	50 46 43	2391	49 2 56	2399
29	SUN	W.	110 52 31	2610	112 31 12	2612	114 9 50	2615	115 48 24	2618
	SATURN	W.	95 7 1	2341	96 52 1	2344	98 36 57	2346	100 21 50	2348
	VENUS	W.	65 59 23	2628	67 37 40	2629	69 15 55	2632	70 54 7	2634
	Regulus	W.	60 36 56	2298	62 22 58	2301	64 8 56	2303	65 54 51	2305
	Antares	E.	40 26 54	2448	38 44 27	2462	37 2 20	2478	35 20 36	2496
	α Aquilæ	E.	88 50 53	2818	87 16 49	2822	85 42 50	2827	84 8 57	2832
30	SUN	W.	124 0 13	2635	125 38 20	2640	127 16 21	2644	128 54 16	2649
	SATURN	W.	109 5 13	2364	110 49 40	2368	112 34 1	2372	114 18 16	2376
	VENUS	W.	79 4 14	2649	80 42 2	2652	82 19 46	2656	83 57 25	2660
	Regulus	W.	74 43 27	2321	76 28 56	2324	78 14 20	2328	79 59 38	2332
	Antares	E.	26 59 49	2645	25 21 55	2693	23 45 6	2752	22 9 35	2825
	α Aquilæ	E.	76 21 54	2880	74 49 9	2892	73 16 40	2906	71 44 29	2923

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Frid.	1	6 40 24.40	10.340	N.23 7 36.5	− 9.98	15 46.17	68.79	3 30.43	0.483
Sat.	2	6 44 32.42	10.328	23 3 24.9	10.99	15 46.17	68.75	3 41.86	0.471
SUN.	3	6 48 40.16	10.316	22 58 49.1	11.99	15 46.17	68.71	3 53.01	0.459
Mon.	4	6 52 47.59	10.303	22 53 49.2	−12.99	15 46.18	68.67	4 3.86	0.446
Tues.	5	6 56 54.71	10.289	22 48 25.4	13.98	15 46.19	68.63	4 14.40	0.432
Wed.	6	7 1 1.49	10.275	22 42 37.9	14.96	15 46.20	68.58	4 24.59	0.418
Thur.	7	7 5 7.91	10.260	22 36 26.7	−15.95	15 46.22	68.53	4 34.43	0.403
Frid.	8	7 9 13.97	10.245	22 29 52.0	16.93	15 46.24	68.48	4 43.90	0.388
Sat.	9	7 13 19.65	10.229	22 22 53.9	17.90	15 46.26	68.42	4 53.00	0.372
SUN.	10	7 17 24.95	10.212	22 15 32.7	−18.86	15 46.28	68.36	5 1.72	0.355
Mon.	11	7 21 29.84	10.195	22 7 48.4	19.82	15 46.31	68.30	5 10.03	0.338
Tues.	12	7 25 34.30	10.177	21 59 41.3	20.77	15 46.34	68.24	5 17.91	0.320
Wed.	13	7 29 38.32	10.158	21 51 11.5	−21.71	15 46.38	68.17	5 25.36	0.301
Thur.	14	7 33 41.90	10.139	21 42 19.2	22.64	15 46.42	68.10	5 32.36	0.282
Frid.	15	7 37 45.00	10.120	21 33 4.7	23.56	15 46.47	68.03	5 38.88	0.263
Sat.	16	7 41 47.62	10.100	21 23 28.2	−24.47	15 46.52	67.96	5 44.92	0.243
SUN.	17	7 45 49.74	10.079	21 13 29.9	25.38	15 46.58	67.89	5 50.48	0.222
Mon.	18	7 49 51.36	10.057	21 3 9.9	26.27	15 46.64	67.82	5 55.53	0.200
Tues.	19	7 53 52.45	10.034	20 52 28.4	−27.16	15 46.70	67.74	6 0.05	0.178
Wed.	20	7 57 53.00	10.011	20 41 25.9	28.03	15 46.77	67.66	6 4.04	0.155
Thur.	21	8 1 53.00	9.987	20 30 2.5	28.90	15 46.85	67.58	6 7.47	0.131
Frid.	22	8 5 52.42	9.963	20 18 18.4	−29.75	15 46.93	67.50	6 10.32	0.107
Sat.	23	8 9 51.25	9.939	20 6 13.9	30.60	15 47.02	67.42	6 12.60	0.083
SUN.	24	8 13 49.50	9.915	19 53 49.2	31.43	15 47.12	67.34	6 14.29	0.059
Mon.	25	8 17 47.15	9.890	19 41 4.7	−32.26	15 47.22	67.25	6 15.39	0.034
Tues.	26	8 21 44.20	9.865	19 28 0.6	33.07	15 47.32	67.17	6 15.88	0.009
Wed.	27	8 25 40.64	9.839	19 14 37.1	33.87	15 47.43	67.08	6 15.75	0.017
Thur.	28	8 29 36.45	9.813	19 0 54.5	−34.66	15 47.54	67.00	6 15.01	0.043
Frid.	29	8 33 31.64	9.787	18 46 53.2	35.44	15 47.66	66.91	6 13.66	0.069
Sat.	30	8 37 26.21	9.761	18 32 33.4	36.20	15 47.78	66.83	6 11.68	0.095
SUN.	31	8 41 20.16	9.735	18 17 55.4	36.96	15 47.91	66.74	6 9.07	0.121
Mon.	32	8 45 13.48	9.709	N.18 2 59.4	−37.70	15 48.04	66.66	6 5.85	0.147

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^s.19$ from the sidereal time.
The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Frid.	1	6 40 23.79	10.339	N. 23 7 37.1	- 9.98	3 30.40	0.483	6 36 53.39
Sat.	2	6 44 31.78	10.327	23 3 25.6	10.99	3 41.83	0.471	6 40 49.95
SUN.	3	6 48 39.49	10.315	22 58 49.9	11.99	3 52.98	0.459	6 44 46.50
Mon.	4	6 52 46.89	10.302	22 53 50.1	-12.99	4 3.83	0.446	6 48 43.06
Tues.	5	6 56 53.98	10.288	22 48 26.4	13.98	4 14.37	0.432	6 52 39.61
Wed.	6	7 1 0.73	10.274	22 42 39.0	14.96	4 24.56	0.418	6 56 36.17
Thur.	7	7 5 7.13	10.259	22 36 27.9	-15.95	4 34.40	0.403	7 0 32.73
Frid.	8	7 9 13.16	10.244	22 29 53.3	16.93	4 43.87	0.388	7 4 29.29
Sat.	9	7 13 18.82	10.228	22 22 55.3	17.90	4 52.98	0.372	7 8 25.84
SUN.	10	7 17 24.09	10.211	22 15 34.2	-18.86	5 1.69	0.355	7 12 22.40
Mon.	11	7 21 28.96	10.194	22 7 50.1	19.82	5 10.00	0.338	7 16 18.96
Tues.	12	7 25 33.40	10.176	21 59 43.1	20.77	5 17.88	0.320	7 20 15.52
Wed.	13	7 29 37.40	10.157	21 51 13.4	-21.71	5 25.33	0.301	7 24 12.07
Thur.	14	7 33 40.96	10.138	21 42 21.3	22.64	5 32.33	0.282	7 28 8.63
Frid.	15	7 37 44.05	10.119	21 33 6.9	23.56	5 38.86	0.263	7 32 5.19
Sat.	16	7 41 46.65	10.099	21 23 30.5	-24.47	5 44.90	0.243	7 36 1.75
SUN.	17	7 45 48.76	10.078	21 13 32.3	25.38	5 50.46	0.222	7 39 58.30
Mon.	18	7 49 50.37	10.056	21 3 12.4	26.27	5 55.51	0.200	7 43 54.86
Tues.	19	7 53 51.45	10.034	20 52 31.1	-27.16	6 0.04	0.178	7 47 51.41
Wed.	20	7 57 51.99	10.011	20 41 28.7	28.03	6 4.03	0.155	7 51 47.97
Thur.	21	8 1 51.98	9.987	20 30 5.4	28.90	6 7.46	0.131	7 55 44.52
Frid.	22	8 5 51.39	9.963	20 18 21.4	-29.75	6 10.31	0.107	7 59 41.08
Sat.	23	8 9 50.22	9.939	20 6 17.0	30.60	6 12.59	0.083	8 3 37.63
SUN.	24	8 13 48.47	9.915	19 53 52.4	31.43	6 14.28	0.059	8 7 34.19
Mon.	25	8 17 46.12	9.890	19 41 8.0	-32.26	6 15.38	0.034	8 11 30.74
Tues.	26	8 21 43.17	9.865	19 28 4.0	33.07	6 15.87	0.009	8 15 27.30
Wed.	27	8 25 39.60	9.839	19 14 40.6	33.87	6 15.75	0.017	8 19 23.85
Thur.	28	8 29 35.42	9.813	19 0 58.1	-34.66	6 15.01	0.043	8 23 20.41
Frid.	29	8 33 30.62	9.787	18 46 56.9	35.44	6 13.66	0.069	8 27 16.96
Sat.	30	8 37 25.20	9.761	18 32 37.2	36.20	6 11.68	0.095	8 31 13.52
SUN.	31	8 41 19.16	9.735	18 17 59.2	36.96	6 9.08	0.121	8 35 10.08
Mon.	32	8 45 12.49	9.709	N. 18 3 3.2	-37.70	6 5.86	0.147	8 39 6.64

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign – prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour, + $9^s.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE.		THE SUN'S Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		λ	λ'					
		° ′ ″	′ ″	″	″			h m s
1	182	99 17 8.2	16 54.0	142.97	+ 0.66	0.0072029	+ 0.6	17 20 15.72
2	183	100 14 19.3	14 4.9	142.96	0.65	0 0072035	− 0.1	17 16 19.81
3	184	101 11 30.1	11 15.5	142.95	0.61	0.0072025	0.7	17 12 23.90
4	185	102 8 40.7	8 25.9	142.95	+ 0.55	0.0072000	− 1.3	17 8 27.99
5	186	103 5 51.4	5 36.5	142.95	0.47	0.0071962	1.9	17 4 32.08
6	187	104 3 2.2	2 47.2	142.95	0.36	0.0071909	2.5	17 0 36.16
7	188	104 60 13.1	59 57.9	142.96	+ 0.24	0.0071841	− 3.2	16 56 40.25
8	189	105 57 24.2	57 8.8	142.97	+ 0.11	0.0071757	3.8	16 52 44.34
9	190	106 54 35.6	54 20.0	142.98	− 0.01	0 0071659	4.4	16 48 48.43
10	191	107 51 47.4	51 31.6	143.00	− 0.13	0.0071546	− 5.1	16 44 52.52
11	192	108 48 59.7	48 43.7	143.02	0.24	0.0071415	5.8	16 40 56.61
12	193	109 46 12.5	45 56.4	143.04	0.33	0.0071266	6.6	16 37 0.70
13	194	110 43 25.9	43 9.7	143.07	− 0.40	0.0071097	− 7.4	16 33 4.79
14	195	111 40 39.9	40 23.5	143.09	0.44	0.0070908	8.3	16 29 8.87
15	196	112 37 54.5	37 37.9	143.12	0.44	0.0070696	9.3	16 25 12.96
16	197	113 35 9.7	34 52.9	143.14	− 0.42	0.0070461	− 10.3	16 21 17.05
17	198	114 32 25.6	32 8.7	143.17	0.37	0.0070203	11.3	16 17 21.14
18	199	115 29 42.1	29 25.1	143.19	0.29	0.0069920	12.3	16 13 25.23
19	200	116 26 59.2	26 42.0	143.22	− 0.18	0.0069611	− 13.4	16 9 29.32
20	201	117 24 16.9	23 59.5	143.24	− 0.06	0.0069277	14.5	16 5 33.41
21	202	118 21 35.2	21 17.6	143.27	+ 0.06	0.0068918	15.5	16 1 37.51
22	203	119 18 54.0	18 36.3	143.29	+ 0.20	0.0068533	− 16.5	15 57 41.60
23	204	120 16 13 3	15 55.5	143.31	0.34	0.0068122	17.6	15 53 45.69
24	205	121 13 33.1	13 15.2	143.33	0.46	0.0067686	18.6	15 49 49.78
25	206	122 10 53.3	10 35.2	143.35	+ 0.57	0.0067227	− 19.6	15 45 53.87
26	207	123 8 14.0	7 55.7	143.37	0.66	0.0066746	20.5	15 41 57.96
27	208	124 5 35.1	5 16.7	143.39	0.72	0.0066244	21.4	15 38 2.05
28	209	125 2 56.7	2 38.2	143.41	+ 0.75	0.0065721	− 22.2	15 34 6.14
29	210	126 0 18.8	0 0.2	143.44	0.75	0.0065180	22.9	15 30 10.23
30	211	126 57 41.6	57 22.8	143.46	0.71	0.0064624	23.5	15 26 14.32
31	212	127 55 5.0	54 46.0	143.49	0.65	0.0064053	24.1	15 22 18.41
32	213	128 52 29.0	52 9.9	143.52	+ 0.57	0.0063467	− 24.7	15 18 22.50

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January $0^d.0$.

Diff. for 1 Hour,
— $9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 4.3	16 1.8	58 52.2	−0.70	58 43.1	−0.82	8 58.4	2.25	10.0
2	15 58.9	15 55.7	58 32.5	0.94	58 20.6	1.05	9 53.0	2.30	11.0
3	15 52.1	15 48.1	58 7.3	1.16	57 52.8	1.26	10 48.3	2.31	12.0
4	15 43.8	15 39.3	57 37.1	−1.35	57 20.5	−1.42	11 43.6	2.28	13.0
5	15 34.6	15 29.7	57 3.1	1.47	56 45.2	1.50	12 37.7	2.22	14.0
6	15 24.8	15 19.9	56 27.1	1.51	56 9.1	1.48	13 29.8	2.12	15.0
7	15 15.1	15 10.5	55 51.5	−1.44	55 34.6	−1.37	14 19.3	2.01	16.0
8	15 6.1	15 2.1	55 18.6	1.28	55 3.9	1.16	15 6.2	1.90	17.0
9	14 58.5	14 55.4	54 50.7	1.03	54 39.2	0.88	15 50.8	1.82	18.0
10	14 52.8	14 50.8	54 29.6	−0.70	54 22.3	−0.51	16 33.7	1.76	19.0
11	14 49.4	14 48.7	54 17.3	−0.32	54 14.6	−0.12	17 15.8	1.74	20.0
12	14 48.7	14 49.3	54 14.5	+0.10	54 17.0	+0.31	17 57.7	1.76	21.0
13	14 50.7	14 52.8	54 22.0	+0.53	54 29.6	+0.74	18 40.3	1.80	22.0
14	14 55.5	14 58.9	54 39.7	0.94	54 52.2	1.13	19 24.4	1.88	23.0
15	15 2.9	15 7.5	55 6.9	1.31	55 23.7	1.48	20 10.9	1.99	24.0
16	15 12.6	15 18.1	55 42.4	+1.62	56 2.6	+1.73	21 0.1	2.12	25.0
17	15 23.9	15 30.0	56 24.0	1.82	56 46.2	1.87	21 52.3	2.24	26.0
18	15 36.1	15 42.3	57 8.8	1.89	57 31.4	1.87	22 47.1	2.33	27.0
19	15 48.3	15 54.1	57 53.6	+1.81	58 14.8	+1.71	23 43.7	2.38	28.0
20	15 59.5	16 4.4	58 34.7	1.58	58 52.8	1.42	☌		29.0
21	16 8.8	16 12.5	59 8.8	1.23	59 22.4	1.02	0 40.8	2.37	0.6
22	16 15.5	16 17.7	59 33.3	+0.80	59 41.5	+0.57	1 37.3	2.33	1.6
23	16 19.2	16 19.9	59 46.9	+0.33	59 49.5	+0.11	2 32.6	2.27	2.6
24	16 19.9	16 19.2	59 49.5	−0.10	59 47.1	−0.29	3 26.3	2.21	3.6
25	16 18.0	16 16.2	59 42.5	−0.47	59 35.9	−0.62	4 18.7	2.16	4.6
26	16 13.9	16 11.3	59 27.6	0.75	59 17.9	0.86	5 10.5	2.15	5.6
27	16 8.3	16 5.1	59 7.0	0.95	58 55.2	1.02	6 2.2	2.17	6.6
28	16 1.7	15 58.1	58 42.6	−1.08	58 29.4	−1.12	6 54.6	2.20	7.6
29	15 54.4	15 50.6	58 15.8	1.15	58 1.8	1.18	7 47.8	2.24	8.6
30	15 46.6	15 42.7	57 47.4	1.21	57 32.8	1.22	8 41.8	2.26	9.6
31	15 38.7	15 34.6	57 18.1	1.23	57 3.2	1.25	9 36.0	2.25	10.6
32	15 30.5	15 26.4	56 48.1	−1.26	56 33.1	−1.26	10 29.7	2.21	11.6

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 1.					**SUNDAY 3.**				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 15 56.77	2.3120	S. 12 46 33.3	9.209	0	17 9 0.61	2.3872	S. 18 21 59.3	4.478
1	15 18 15.55	2.3141	12 55 43.5	9.130	1	17 11 23.86	2.3877	18 26 24.5	4.363
2	15 20 34.46	2.3162	13 4 48.9	9.050	2	17 13 47.14	2.3882	18 30 42.9	4.249
3	15 22 53.49	2.3182	13 13 49.5	8.969	3	17 16 10.45	2.3887	18 34 54.4	4.134
4	15 25 12.64	2.3202	13 22 45.2	8.887	4	17 18 33.78	2.3891	18 38 59.0	4.019
5	15 27 31.92	2.3223	13 31 36.0	8.805	5	17 20 57.14	2.3895	18 42 56.7	3.903
6	15 29 51.32	2.3243	13 40 21.8	8.721	6	17 23 20.52	2.3897	18 46 47.4	3.787
7	15 32 10.84	2.3263	13 49 2.5	8.636	7	17 25 43.91	2.3899	18 50 31.1	3.671
8	15 34 30.48	2.3283	13 57 38.1	8.551	8	17 28 7.31	2.3901	18 54 7.9	3.555
9	15 36 50.24	2.3303	14 6 8.6	8.465	9	17 30 30.72	2.3902	18 57 37.7	3.438
10	15 39 10.12	2.3323	14 14 33.9	8.377	10	17 32 54.13	2.3902	19 1 0.4	3.320
11	15 41 30.12	2.3344	14 22 53.9	8.289	11	17 35 17.54	2.3901	19 4 16.1	3.203
12	15 43 50.25	2.3364	14 31 8.6	8.200	12	17 37 40.94	2.3899	19 7 24.8	3.086
13	15 46 10.49	2.3383	14 39 17.9	8.109	13	17 40 4.33	2.3898	19 10 26.4	2.968
14	15 48 30.85	2.3402	14 47 21.7	8.018	14	17 42 27.71	2.3896	19 13 21.0	2.851
15	15 50 51.32	2.3422	14 55 20.0	7.926	15	17 44 51.08	2.3893	19 16 8.5	2.733
16	15 53 11.91	2.3441	15 3 12.8	7.833	16	17 47 14.43	2.3889	19 18 48.9	2.614
17	15 55 32.61	2.3459	15 11 0.0	7.740	17	17 49 37.75	2.3884	19 21 22.2	2.496
18	15 57 53.42	2.3478	15 18 41.6	7.646	18	17 52 1.03	2.3878	19 23 48.4	2.377
19	16 0 14.35	2.3497	15 26 17.5	7.550	19	17 54 24.28	2.3873	19 26 7.5	2.259
20	16 2 35.38	2.3514	15 33 47.6	7.454	20	17 56 47.50	2.3867	19 28 19.5	2.141
21	16 4 56.52	2.3532	15 41 11.9	7.357	21	17 59 10.68	2.3859	19 30 24.4	2.022
22	16 7 17.77	2.3550	15 48 30.4	7.259	22	18 1 33.81	2.3851	19 32 22.2	1.904
23	16 9 39.12	2.3567	S. 15 55 43.0	7.161	23	18 3 56.89	2.3842	S. 19 34 12.9	1.786
SATURDAY 2.					**MONDAY 4.**				
0	16 12 0.58	2.3585	S. 16 2 49.7	7.062	0	18 6 19.92	2.3833	S. 19 35 56.5	1.667
1	16 14 22.14	2.3602	16 9 50.4	6.961	1	18 8 42.89	2.3823	19 37 33.0	1.549
2	16 16 43.80	2.3618	16 16 45.0	6.860	2	18 11 5.79	2.3812	19 39 2.4	1.430
3	16 19 5.55	2.3633	16 23 33.6	6.759	3	18 13 28.63	2.3801	19 40 24.6	1.311
4	16 21 27.40	2.3649	16 30 16.1	6.657	4	18 15 51.40	2.3789	19 41 39.7	1.193
5	16 23 49.34	2.3665	16 36 52.4	6.554	5	18 18 14.09	2.3776	19 42 47.8	1.076
6	16 26 11.38	2.3680	16 43 22.5	6.450	6	18 20 36.71	2.3762	19 43 48.8	0.958
7	16 28 33.50	2.3694	16 49 46.4	6.346	7	18 22 59.24	2.3747	19 44 42.7	0.840
8	16 30 55.71	2.3708	16 56 4.0	6.240	8	18 25 21.68	2.3732	19 45 29.6	0.722
9	16 33 18.00	2.3722	17 2 15.2	6.133	9	18 27 44.03	2.3717	19 46 9.4	0.605
10	16 35 40.38	2.3736	17 8 20.0	6.027	10	18 30 6.29	2.3701	19 46 42.2	0.487
11	16 38 2.83	2.3749	17 14 18.4	5.920	11	18 32 28.44	2.3684	19 47 7.9	0.370
12	16 40 25.36	2.3762	17 20 10.4	5.812	12	18 34 50.49	2.3666	19 47 26.6	0.253
13	16 42 47.97	2.3773	17 25 55.9	5.704	13	18 37 12.43	2.3648	19 47 38.3	0.137
14	16 45 10.64	2.3784	17 31 34.9	5.595	14	18 39 34.26	2.3629	19 47 43.0	−0.021
15	16 47 33.38	2.3795	17 37 7.3	5.486	15	18 41 55.98	2.3610	19 47 40.8	+0.095
16	16 49 56.18	2.3806	17 42 33.2	5.376	16	18 44 17.58	2.3589	19 47 31.6	0.211
17	16 52 19.05	2.3817	17 47 52.4	5.265	17	18 46 39.05	2.3567	19 47 15.5	0.327
18	16 54 41.98	2.3826	17 53 5.0	5.154	18	18 49 0.39	2.3546	19 46 52.4	0.442
19	16 57 4.96	2.3835	17 58 10.9	5.043	19	18 51 21.60	2.3524	19 46 22.4	0.557
20	16 59 28.00	2.3844	18 3 10.1	4.931	20	18 53 42.68	2.3502	19 45 45.6	0.671
21	17 1 51.09	2.3852	18 8 2.6	4.818	21	18 56 3.62	2.3478	19 45 1.9	0.785
22	17 4 14.22	2.3859	18 12 48.3	4.705	22	18 58 24.41	2.3454	19 44 11.4	0.898
23	17 6 37.39	2.3866	18 17 27.2	4.592	23	19 0 45.06	2.3429	19 43 14.1	1.011
24	17 9 0.61	2.3872	S. 18 21 59.3	4.478	24	19 3 5.56	2.3403	S. 19 42 10.0	1.124

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 3 5.56	2.3403	S. 19 42 10.0	1.194
1	19 5 25.90	2.3377	19 40 59.2	1.237
2	19 7 46.08	2.3351	19 39 41.6	1.349
3	19 10 6.11	2.3324	19 38 17.3	1.460
4	19 12 25.97	2.3296	19 36 46.4	1.571
5	19 14 45.66	2.3267	19 35 8.8	1.682
6	19 17 5.18	2.3238	19 33 24.6	1.792
7	19 19 24.52	2.3209	19 31 33.8	1.901
8	19 21 43.69	2.3180	19 29 36.5	2.009
9	19 24 2.68	2.3149	19 27 32.7	2.117
10	19 26 21.48	2.3118	19 25 22.4	2.225
11	19 28 40.09	2.3086	19 23 5.7	2.333
12	19 30 58.51	2.3054	19 20 42.5	2.440
13	19 33 16.74	2.3022	19 18 12.9	2.546
14	19 35 34.77	2.2989	19 15 37.0	2.650
15	19 37 52.60	2.2955	19 12 54.9	2.754
16	19 40 10.23	2.2922	19 10 6.5	2.859
17	19 42 27.66	2.2888	19 7 11.8	2.963
18	19 44 44.88	2.2853	19 4 10.9	3.066
19	19 47 1.89	2.2818	19 1 3.9	3.168
20	19 49 18.69	2.2782	18 57 50.8	3.269
21	19 51 35.27	2.2745	18 54 31.6	3.370
22	19 53 51.63	2.2708	18 51 6.4	3.470
23	19 56 7.77	2.2672	S. 18 47 35.2	3.569

WEDNESDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 58 23.70	2.2636	S. 18 43 58.1	3.668
1	20 0 39.40	2.2598	18 40 15.1	3.766
2	20 2 54.87	2.2560	18 36 26.2	3.863
3	20 5 10.12	2.2522	18 32 31.5	3.960
4	20 7 25.14	2.2484	18 28 31.0	4.056
5	20 9 39.93	2.2445	18 24 24.8	4.151
6	20 11 54.48	2.2406	18 20 12.9	4.245
7	20 14 8.80	2.2367	18 15 55.4	4.338
8	20 16 22.88	2.2327	18 11 32.3	4.431
9	20 18 36.72	2.2287	18 7 3.6	4.524
10	20 20 50.32	2.2247	18 2 29.4	4.615
11	20 23 3.68	2.2207	17 57 49.8	4.705
12	20 25 16.80	2.2166	17 53 4.8	4.794
13	20 27 29.67	2.2125	17 48 14.5	4.883
14	20 29 42.30	2.2085	17 43 18.8	4.972
15	20 31 54.69	2.2044	17 38 17.8	5.060
16	20 34 6.83	2.2002	17 33 11.6	5.146
17	20 36 18.72	2.1961	17 28 0.3	5.231
18	20 38 30.36	2.1919	17 22 43.9	5.316
19	20 40 41.75	2.1877	17 17 22.4	5.400
20	20 42 52.89	2.1836	17 11 55.9	5.483
21	20 45 3.78	2.1794	17 6 24.4	5.566
22	20 47 14.42	2.1752	17 0 48.0	5.647
23	20 49 24.81	2.1710	16 55 6.8	5.728
24	20 51 34.94	2.1668	S. 16 49 20.7	5.808

THURSDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 51 34.94	2.1668	S. 16 49 20.7	5.808
1	20 53 44.82	2.1626	16 43 29.8	5.887
2	20 55 54.45	2.1584	16 37 34.2	5.966
3	20 58 3.83	2.1542	16 31 33.9	6.043
4	21 0 12.95	2.1499	16 25 29.0	6.119
5	21 2 21.82	2.1457	16 19 19.6	6.194
6	21 4 30.43	2.1414	16 13 5.7	6.269
7	21 6 38.79	2.1372	16 6 47.3	6.344
8	21 8 46.90	2.1330	16 0 24.4	6.417
9	21 10 54.75	2.1288	15 53 57.2	6.490
10	21 13 2.35	2.1246	15 47 25.6	6.562
11	21 15 9.70	2.1204	15 40 49.7	6.632
12	21 17 16.80	2.1162	15 34 9.7	6.702
13	21 19 23.65	2.1120	15 27 25.5	6.771
14	21 21 30.24	2.1078	15 20 37.2	6.839
15	21 23 36.58	2.1036	15 13 44.8	6.907
16	21 25 42.67	2.0995	15 6 48.3	6.975
17	21 27 48.52	2.0954	14 59 47.8	7.041
18	21 29 54.12	2.0912	14 52 43.4	7.105
19	21 31 59.47	2.0871	14 45 35.2	7.169
20	21 34 4.57	2.0830	14 38 23.1	7.233
21	21 36 9.43	2.0789	14 31 7.2	7.296
22	21 38 14.04	2.0748	14 23 47.6	7.357
23	21 40 18.41	2.0708	S. 14 16 24.4	7.418

FRIDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	21 42 22.54	2.0668	S. 14 8 57.5	7.478
1	21 44 26.43	2.0627	14 1 27.0	7.537
2	21 46 30.07	2.0587	13 53 53.0	7.596
3	21 48 33.47	2.0547	13 46 15.5	7.653
4	21 50 36.64	2.0508	13 38 34.6	7.710
5	21 52 39.57	2.0469	13 30 50.3	7.767
6	21 54 42.27	2.0431	13 23 2.6	7.822
7	21 56 44.74	2.0392	13 15 11.6	7.877
8	21 58 46.97	2.0353	13 7 17.4	7.930
9	22 0 48.97	2.0314	12 59 20.0	7.983
10	22 2 50.74	2.0277	12 51 19.4	8.035
11	22 4 52.29	2.0239	12 43 15.8	8.086
12	22 6 53.61	2.0202	12 35 9.1	8.137
13	22 8 54.71	2.0165	12 26 59.4	8.187
14	22 10 55.59	2.0128	12 18 46.7	8.236
15	22 12 56.24	2.0091	12 10 31.1	8.284
16	22 14 56.68	2.0055	12 2 12.6	8.332
17	22 16 56.90	2.0019	11 53 51.2	8.379
18	22 18 56.91	1.9984	11 45 27.1	8.424
19	22 20 56.71	1.9949	11 37 0.3	8.469
20	22 22 56.30	1.9914	11 28 30.8	8.514
21	22 24 55.68	1.9879	11 19 58.6	8.558
22	22 26 54.85	1.9844	11 11 23.8	8.601
23	22 28 53.81	1.9810	11 2 46.5	8.643
24	22 30 52.57	1.9777	S. 10 54 6.6	8.685

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 30 52.57	1.9777	S. 10 54 6.6	8.685
1	22 32 51.14	1.9745	10 45 24.3	8.726
2	22 34 49.51	1.9712	10 36 39.5	8.767
3	22 36 47.68	1.9679	10 27 52.3	8.806
4	22 38 45 66	1.9647	10 19 2.8	8.844
5	22 40 43.45	1.9616	10 10 11.0	8.882
6	22 42 41.06	1.9586	10 1 17.0	8.919
7	22 44 38.48	1.9555	9 52 20.7	8.956
8	22 46 35.72	1.9524	9 43 22.3	8.992
9	22 48 32.77	1.9493	9 34 21.7	9.027
10	22 50 29.64	1.9464	9 25 19.0	9.062
11	22 52 26.34	1.9436	9 16 14.3	9.095
12	22 54 22.87	1.9407	9 7 7.6	9.128
13	22 56 19.23	1.9379	8 57 58.9	9.161
14	22 58 15.42	1.9351	8 48 48.3	9.193
15	23 0 11.44	1.9323	8 39 35.7	9.225
16	23 2 7.30	1.9296	8 30 21.3	9.255
17	23 4 3.00	1.9270	8 21 5.1	9.284
18	23 5 58.54	1.9244	8 11 47.2	9.313
19	23 7 53.93	1.9219	8 2 27.5	9.342
20	23 9 49.17	1.9194	7 53 6.1	9.370
21	23 11 44.26	1.9169	7 43 43.1	9.397
22	23 13 39.20	1.9144	7 34 18.5	9.424
23	23 15 33.99	1.9120	S. 7 24 52.3	9.450

SUNDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 17 28.64	1.9097	S. 7 15 24.5	9.475
1	23 19 23.16	1.9075	7 5 55.3	9.499
2	23 21 17.54	1.9053	6 56 24.6	9.524
3	23 23 11.79	1.9031	6 46 52.4	9.548
4	23 25 5.91	1.9009	6 37 18.8	9.571
5	23 26 59.90	1.8988	6 27 43.9	9.593
6	23 28 53.77	1.8968	6 18 7.7	9.614
7	23 30 47.52	1.8948	6 8 30.2	9.635
8	23 32 41.15	1.8928	5 58 51.5	9.656
9	23 34 34.66	1.8909	5 49 11.5	9.676
10	23 36 28.06	1.8891	5 39 30.4	9.694
11	23 38 21.36	1 8874	5 29 48.2	9.713
12	23 40 14.55	1.8857	5 20 4.9	9.731
13	23 42 7.64	1.8840	5 10 20.5	9.748
14	23 44 0.63	1.8823	5 0 35.1	9.765
15	23 45 53.52	1.8807	4 50 48.7	9.782
16	23 47 46.32	1.8792	4 41 1.3	9.797
17	23 49 39.02	1.8776	4 31 13.0	9.812
18	23 51 31.63	1.8762	4 21 23.8	9.827
19	23 53 24.16	1.8748	4 11 33.8	9.841
20	23 55 16.61	1.8735	4 1 42.9	9.855
21	23 57 8.98	1.8722	3 51 51.2	9.867
22	23 59 1.27	1.8710	3 41 58.8	9.879
23	0 0 53.50	1.8699	3 32 5.7	9.891
24	0 2 45.66	1.8687	S. 3 22 11.8	9.903

MONDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 2 45.66	1.8687	S. 3 22 11.8	9.903
1	0 4 37.75	1.8676	3 12 17.3	9.913
2	0 6 29.77	1.8665	3 2 22.2	9.923
3	0 8 21.73	1.8656	2 52 26.6	9.932
4	0 10 13.64	1.8647	2 42 30.4	9.941
5	0 12 5.50	1.8639	2 32 33.7	9.950
6	0 13 57.31	1.8631	2 22 36.4	9.958
7	0 15 49.07	1.8623	2 12 38.7	9.965
8	0 17 40.79	1.8616	2 2 40.6	9.971
9	0 19 32.46	1.8609	1 52 42.2	9.977
10	0 21 24.10	1.8603	1 42 43.4	9.982
11	0 23 15.70	1.8597	1 32 44.3	9.988
12	0 25 7.27	1.8592	1 22 44.8	9.993
13	0 26 58.81	1.8588	1 12 45.1	9.997
14	0 28 50.33	1.8585	1 2 45.2	10.000
15	0 30 41.83	1.8582	0 52 45.1	10.003
16	0 32 33.31	1.8578	0 42 44.8	10.006
17	0 34 24.77	1.8576	0 32 44.4	10.007
18	0 36 16.22	1.8574	0 22 43.9	10.008
19	0 38 7.66	1 8573	0 12 43.4	10.009
20	0 39 59.10	1.8572	S. 0 2 42.8	10.010
21	0 41 50.53	1.8572	N. 0 7 17.8	10.010
22	0 43 41.97	1.8573	0 17 18.4	10.009
23	0 45 33.41	1.8574	N 0 27 18.9	10.008

TUESDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 47 24.86	1.8576	N. 0 37 19.3	10.006
1	0 49 16.32	1.8578	0 47 19.6	10.003
2	0 51 7.80	1.8581	0 57 19.7	10.000
3	0 52 59.29	1.8584	1 7 19.6	9.997
4	0 54 50.80	1.8588	1 17 19.3	9.993
5	0 56 42.34	1.8592	1 27 18.7	9.988
6	0 58 33.90	1.8596	1 37 17.9	9.983
7	1 0 25.49	1.8602	1 47 16.7	9.978
8	1 2 17.12	1.8608	1 57 15.2	9.972
9	1 4 8.78	1.8614	2 7 13.3	9.965
10	1 6 0.48	1.8621	2 17 11.0	9.957
11	1 7 52.23	1.8629	2 27 8.2	9.950
12	1 9 44.03	1.8637	2 37 5.0	9.942
13	1 11 35.88	1.8646	2 47 1.3	9.933
14	1 13 27.78	1.8654	2 56 57.0	9.923
15	1 15 19.73	1.8663	3 6 52.1	9.913
16	1 17 11.74	1.8674	3 16 46.6	9.903
17	1 19 3.82	1.8685	3 26 40.4	9.892
18	1 20 55.96	1.8696	3 36 33.6	9.881
19	1 22 48.17	1.8708	3 46 26.1	9.868
20	1 24 40.46	1.8721	3 56 17.8	9.855
21	1 26 32.82	1.8734	4 6 8.7	9.842
22	1 28 25.26	1.8747	4 15 58.8	9.828
23	1 30 17.78	1.8761	4 25 48.1	9.814
24	1 32 10.39	1.8776	N. 4 35 36.5	9.799

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 13.					**FRIDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 32 10.39	1.8776	N. 4 35 36.5	9.799	0	3 4 56.80	2.0067	N.11 57 27.2	8.365
1	1 34 3.09	1.8791	4 45 24.0	9.783	1	3 6 57.31	2.0105	12 5 47.7	8.318
2	1 35 55.88	1.8806	4 55 10.5	9.768	2	3 8 58.06	2.0144	12 14 5.3	8.270
3	1 37 48.76	1.8822	5 4 56.1	9.752	3	3 10 59.04	2.0183	12 22 20.1	8.222
4	1 39 41.74	1.8838	5 14 40.7	9.734	4	3 13 0.25	2.0222	12 30 32.0	8.173
5	1 41 34.82	1.8856	5 24 24.2	9.716	5	3 15 1.70	2.0262	12 38 40.9	8.123
6	1 43 28.01	1.8874	5 34 6.6	9.697	6	3 17 3.39	2.0302	12 46 46.8	8.073
7	1 45 21.31	1.8892	5 43 47.9	9.678	7	3 19 5.32	2.0342	12 54 49.7	8.022
8	1 47 14.72	1.8911	5 53 28.0	9.659	8	3 21 7.49	2.0382	13 2 49.5	7.970
9	1 49 8.24	1.8930	6 3 7.0	9.640	9	3 23 9.91	2.0423	13 10 46.1	7.918
10	1 51 1.88	1.8950	6 12 44.8	9.619	10	3 25 12.57	2.0464	13 18 39.6	7.865
11	1 52 55.64	1.8970	6 22 21.3	9.598	11	3 27 15.48	2.0506	13 26 29.9	7.810
12	1 54 49.52	1.8991	6 31 56.5	9.576	12	3 29 18.64	2.0548	13 34 16.8	7.754
13	1 56 43.53	1.9012	6 41 30.4	9.554	13	3 31 22.05	2.0590	13 42 0.4	7.699
14	1 58 37.67	1.9034	6 51 2.9	9.531	14	3 33 25.72	2.0633	13 49 40.7	7.642
15	2 0 31.94	1.9056	7 0 34.1	9.507	15	3 35 29.65	2.0676	13 57 17.5	7.584
16	2 2 26.34	1.9079	7 10 3.8	9.482	16	3 37 33.84	2.0719	14 4 50.8	7.526
17	2 4 20.89	1.9103	7 19 32.0	9.457	17	3 39 38.28	2.0763	14 12 20.6	7.467
18	2 6 15.58	1.9127	7 28 58.7	9.432	18	3 41 42.99	2.0807	14 19 46.9	7.408
19	2 8 10.42	1.9151	7 38 23.8	9.406	19	3 43 47.96	2.0850	14 27 9.6	7.347
20	2 10 5.40	1.9176	7 47 47.4	9.380	20	3 45 53.19	2.0894	14 34 28.5	7.284
21	2 12 0.53	1.9202	7 57 9.4	9.352	21	3 47 58.69	2.0939	14 41 43.7	7.221
22	2 13 55.82	1.9227	8 6 29.7	9.324	22	3 50 4.46	2.0984	14 48 55.1	7.158
23	2 15 51.26	1.9253	N. 8 15 48.3	9.296	23	3 52 10.50	2.1028	N.14 56 2.7	7.095
	THURSDAY 14.					**SATURDAY 16.**			
0	2 17 46.86	1.9281	N. 8 25 5.2	9.267	0	3 54 16.80	2.1073	N.15 3 6.5	7.031
1	2 19 42.63	1.9308	8 34 20.3	9.237	1	3 56 23.37	2.1118	15 10 6.4	6.965
2	2 21 38.56	1.9336	8 43 33.6	9.207	2	3 58 30.22	2.1164	15 17 2.3	6.897
3	2 23 31.66	1.9364	8 52 45.1	9.175	3	4 0 37.34	2.1210	15 23 54.1	6.829
4	2 25 30.93	1.9393	9 1 54.6	9.143	4	4 2 44.74	2.1256	15 30 41.8	6.761
5	2 27 27.38	1.9423	9 11 2.2	9.111	5	4 4 52.41	2.1302	15 37 25.4	6.692
6	2 29 24.01	1.9453	9 20 7.9	9.078	6	4 7 0.36	2.1348	15 44 4.8	6.622
7	2 31 20.82	1.9483	9 29 11.6	9.044	7	4 9 8.59	2.1395	15 50 40.0	6.551
8	2 33 17.81	1.9514	9 38 13.2	9.009	8	4 11 17.10	2.1441	15 57 10.9	6.479
9	2 35 14.99	1.9545	9 47 12.7	8.974	9	4 13 25.88	2.1487	16 3 37.5	6.407
10	2 37 12.35	1.9577	9 56 10.1	8.938	10	4 15 34.94	2.1534	16 9 59.7	6.333
11	2 39 9.91	1.9609	10 5 5.3	8.902	11	4 17 44.29	2.1581	16 16 17.4	6.259
12	2 41 7.66	1.9642	10 13 58.4	8.866	12	4 19 53.91	2.1627	16 22 30.7	6.184
13	2 43 5.61	1.9675	10 22 49.2	8.828	13	4 22 3.81	2.1674	16 28 39.5	6.107
14	2 45 3.76	1.9708	10 31 37.7	8.789	14	4 24 14.00	2.1721	16 34 43.6	6.029
15	2 47 2.11	1.9742	10 40 23.9	8.750	15	4 26 24.47	2.1768	16 40 43.0	5.951
16	2 49 0.67	1.9776	10 49 7.7	8.709	16	4 28 35.22	2.1816	16 46 37.7	5.872
17	2 50 59.43	1.9811	10 57 49.0	8.668	17	4 30 46.26	2.1863	16 52 27.7	5.793
18	2 52 58.40	1.9847	11 6 27.9	8.627	18	4 32 57.58	2.1910	16 58 12.9	5.712
19	2 54 57.59	1.9882	11 15 4.3	8.585	19	4 35 9.18	2.1957	17 3 53.2	5.631
20	2 56 56.99	1.9918	11 23 38.1	8.542	20	4 37 21.06	2.2004	17 9 28.6	5.548
21	2 58 56.61	1.9955	11 32 9.3	8.498	21	4 39 33.23	2.2051	17 14 59.0	5.465
22	3 0 56.45	1.9992	11 40 37.9	8.455	22	4 41 45.68	2.2098	17 20 24.4	5.381
23	3 2 56.51	2.0029	11 49 3.9	8.411	23	4 43 58.41	2.2145	17 25 44.7	5.296
24	3 4 56.80	2.0067	N.11 57 27.2	8.365	24	4 46 11.42	2.2192	N.17 30 59.9	5.210

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 17.					TUESDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 46 11.42	2.2192	N.17 30 59.9	5.210	0	6 37 38.81	2.4088	N.19 46 28.2	0.156
1	4 48 24.71	2.2239	17 36 9.9	5.123	1	6 40 3.42	2.4115	19 46 33.9	+0.035
2	4 50 38.28	2.2286	17 41 14.7	5.036	2	6 42 28.19	2.4141	19 46 32.4	−0.086
3	4 52 52.14	2.2333	17 46 14.2	4.947	3	6 44 53.11	2.4166	19 46 23.6	0.208
4	4 55 6.28	2.2379	17 51 8.3	4.857	4	6 47 18.18	2.4190	19 46 7.5	0.330
5	4 57 20.69	2.2425	17 55 57.0	4.767	5	6 49 43.39	2.4213	19 45 44.0	0.452
6	4 59 35.38	2.2471	18 0 40.3	4.676	6	6 52 8.74	2.4236	19 45 13.2	0.575
7	5 1 50.35	2.2517	18 5 18.1	4.584	7	6 54 34.23	2.4259	19 44 35.0	0.697
8	5 4 5.59	2.2562	18 9 50.4	4.492	8	6 56 59.85	2.4281	19 43 49.5	0.820
9	5 6 21.10	2.2608	18 14 17.1	4.397	9	6 59 25.60	2.4302	19 42 56.6	0.943
10	5 8 36.89	2.2654	18 18 38.1	4.302	10	7 1 51.47	2.4321	19 41 56.3	1.067
11	5 10 52.95	2.2699	18 22 53.4	4.207	11	7 4 17.45	2.4339	19 40 48.5	1.192
12	5 13 9.28	2.2744	18 27 3.0	4.112	12	7 6 43.54	2.4358	19 39 33.3	1.316
13	5 15 25.88	2.2789	18 31 6.8	4.014	13	7 9 9.74	2.4376	19 38 10.6	1.440
14	5 17 42.75	2.2833	18 35 4.7	3.916	14	7 11 36.05	2.4393	19 36 40.5	1.564
15	5 19 59.88	2.2878	18 38 56.7	3.817	15	7 14 2.46	2.4409	19 35 2.9	1.689
16	5 22 17.28	2.2922	18 42 42.8	3.718	16	7 16 28.96	2.4424	19 33 17.8	1.814
17	5 24 34.94	2.2965	18 46 22.9	3.617	17	7 18 55.55	2.4439	19 31 25.2	1.938
18	5 26 52.86	2.3008	18 49 56.9	3.516	18	7 21 22.23	2.4452	19 29 25.2	2.063
19	5 29 11.04	2.3051	18 53 24.8	3.414	19	7 23 48.98	2.4465	19 27 17.7	2.188
20	5 31 29.48	2.3094	18 56 46.6	3.311	20	7 26 15.81	2.4477	19 25 2.7	2.314
21	5 33 48.17	2.3136	19 0 2.2	3.207	21	7 28 42.71	2.4489	19 22 40.1	2.439
22	5 36 7.11	2.3178	19 3 11.5	3.103	22	7 31 9.68	2.4499	19 20 10.0	2.563
23	5 38 26.30	2.3219	N.19 6 14.6	2.999	23	7 33 36.70	2.4508	N.19 17 32.5	2.687
	MONDAY 18.					WEDNESDAY 20.			
0	5 40 45.74	2.3260	N.19 9 11.4	2.893	0	7 36 3.78	2.4517	N.19 14 47.5	2.812
1	5 43 5.42	2.3301	19 12 1.8	2.787	1	7 38 30.91	2.4525	19 11 55.0	2.937
2	5 45 25.35	2.3341	19 14 45.8	2.679	2	7 40 58.08	2.4533	19 8 55.0	3.062
3	5 47 45.52	2.3381	19 17 23.3	2.571	3	7 43 25.30	2.4540	19 5 47.5	3.187
4	5 50 5.92	2.3420	19 19 54.3	2.462	4	7 45 52.56	2.4546	19 2 32.5	3.312
5	5 52 26.56	2.3459	19 22 18.7	2.352	5	7 48 19.85	2.4550	18 59 10.1	3.436
6	5 54 47.43	2.3497	19 24 36.6	2.242	6	7 50 47.16	2.4554	18 55 40.2	3.560
7	5 57 8.53	2.3535	19 26 47.8	2.132	7	7 53 14.50	2.4557	18 52 2.9	3.683
8	5 59 29.85	2.3572	19 28 52.4	2.021	8	7 55 41.85	2.4560	18 48 18.2	3.807
9	6 1 51.39	2.3608	19 30 50.3	1.908	9	7 58 9.22	2.4562	18 44 26.0	3.931
10	6 4 13.15	2.3645	19 32 41.4	1.796	10	8 0 36.59	2.4563	18 40 26.4	4.054
11	6 6 35.13	2.3681	19 34 25.7	1.682	11	8 3 3.97	2.4563	18 36 19.5	4.176
12	6 8 57.32	2.3716	19 36 3.2	1.568	12	8 5 31.35	2.4562	18 32 5.3	4.299
13	6 11 19.72	2.3750	19 37 33.9	1.453	13	8 7 58.72	2.4561	18 27 43.7	4.421
14	6 13 42.32	2.3784	19 38 57.6	1.338	14	8 10 26.08	2.4559	18 23 14.8	4.542
15	6 16 5.13	2.3818	19 40 14.4	1.222	15	8 12 53.43	2.4557	18 18 38.6	4.664
16	6 18 28.14	2.3850	19 41 24.2	1.105	16	8 15 20.76	2.4553	18 13 55.1	4.786
17	6 20 51.33	2.3881	19 42 27.0	0.988	17	8 17 48.07	2.4549	18 9 4.3	4.909
18	6 23 14.71	2.3912	19 43 22.8	0.871	18	8 20 15.35	2.4544	18 4 6.3	5.027
19	6 25 38.28	2.3943	19 44 11.6	0.753	19	8 22 42.60	2.4538	17 59 1.1	5.146
20	6 28 2.03	2.3974	19 44 53.2	0.634	20	8 25 9.81	2.4532	17 53 48.8	5.264
21	6 30 25.97	2.4004	19 45 27.7	0.515	21	8 27 36.99	2.4526	17 48 29.4	5.383
22	6 32 50.08	2.4033	19 45 55.0	0.396	22	8 30 4.12	2.4518	17 43 2.9	5.501
23	6 35 14.36	2.4061	19 46 15.2	0.277	23	8 32 31.20	2.4509	17 37 29.3	5.618
24	6 37 38.81	2.4088	N.19 46 28.2	0.156	24	8 34 58.23	2.4500	N.17 31 48.7	5.735

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 21.					**SATURDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 34 58.23	2.4500	N.17 31 48.7	5.735	0	10 30 36.61	2.3559	N.10 57 23.8	10.312
1	8 37 25.20	2.4491	17 26 1.1	5.852	1	10 32 57.89	2.3536	10 47 3.0	10.381
2	8 39 52.12	2.4481	17 20 6.5	5.967	2	10 35 19.03	2.3511	10 36 38.1	10.448
3	8 42 18.97	2.4470	17 14 5.0	6.082	3	10 37 40.02	2.3487	10 26 9.2	10.514
4	8 44 45.76	2.4459	17 7 56.6	6.197	4	10 40 0.87	2.3462	10 15 36.4	10.578
5	8 47 12.48	2.4447	17 1 41.4	6.310	5	10 42 21.57	2.3437	10 4 59.8	10.641
6	8 49 39.12	2.4434	16 55 19.4	6.423	6	10 44 42.12	2.3413	9 54 19.5	10.702
7	8 52 5.68	2.4420	16 48 50.6	6.536	7	10 47 2.53	2.3389	9 43 35.5	10.763
8	8 54 32.16	2.4408	16 42 15.1	6.647	8	10 49 22.79	2.3365	9 32 47.9	10.823
9	8 56 58.57	2.4394	16 35 33.0	6.757	9	10 51 42.91	2.3342	9 21 56.7	10.882
10	8 59 24.89	2.4378	16 28 44.3	6.867	10	10 54 2.89	2.3318	9 11 2.1	10.938
11	9 1 51.11	2.4363	16 21 49.0	6.976	11	10 56 22.73	2.3294	9 0 4.2	10.993
12	9 4 17.24	2.4347	16 14 47.2	7.084	12	10 58 42.42	2.3270	8 49 3.0	11.047
13	9 6 43.28	2.4331	16 7 38.9	7.192	13	11 1 1.97	2.3247	8 37 58.6	11.100
14	9 9 9.21	2.4313	16 0 24.2	7.298	14	11 3 21.38	2.3224	8 26 51.0	11.152
15	9 11 35.04	2.4296	15 53 3.1	7.404	15	11 5 40.66	2.3201	8 15 40.4	11.202
16	9 14 0.76	2.4278	15 45 35.7	7.509	16	11 7 59.80	2.3178	8 4 26.8	11.251
17	9 16 26.38	2.4261	15 38 2.0	7.613	17	11 10 18.80	2.3156	7 53 10.3	11.298
18	9 18 51.89	2.4242	15 30 22.1	7.717	18	11 12 37.67	2.3134	7 41 51.0	11.344
19	9 21 17.29	2.4223	15 22 36.0	7.818	19	11 14 56.41	2.3112	7 30 29.0	11.389
20	9 23 42.57	2.4203	15 14 43.9	7.919	20	11 17 15.01	2.3089	7 19 4.3	11.433
21	9 26 7.73	2.4183	15 6 45.7	8.020	21	11 19 33.48	2.3067	7 7 37.0	11.476
22	9 28 32.77	2.4163	14 58 41.5	8.119	22	11 21 51.82	2.3046	6 56 7.2	11.517
23	9 30 57.69	2.4143	N.14 50 31.4	8.217	23	11 24 10.04	2.3026	N. 6 44 35.0	11.557
	FRIDAY 22.					**SUNDAY 24.**			
0	9 33 22.49	2.4122	N.14 42 15.5	8.314	0	11 26 28.13	2.3005	N. 6 33 0.4	11.595
1	9 35 47.16	2.4101	14 33 53.8	8.410	1	11 28 46.10	2.2984	6 21 23.6	11.632
2	9 38 11.70	2.4080	14 25 26.3	8.506	2	11 31 3.94	2.2963	6 9 44.6	11.667
3	9 40 36.12	2.4058	14 16 53.1	8.600	3	11 33 21.66	2.2943	5 58 3.5	11.702
4	9 43 0.40	2.4036	14 8 14.3	8.693	4	11 35 39.26	2.2924	5 46 20.4	11.735
5	9 45 24.55	2.4013	13 59 29.9	8.785	5	11 37 56.75	2.2905	5 34 35.3	11.767
6	9 47 48.56	2.3990	13 50 40.1	8.875	6	11 40 14.12	2.2886	5 22 48.4	11.797
7	9 50 12.43	2.3968	13 41 44.9	8.965	7	11 42 31.38	2.2867	5 10 59.7	11.826
8	9 52 36.17	2.3946	13 32 44.3	9.054	8	11 44 48.52	2.2848	4 59 9.3	11.854
9	9 54 59.78	2.3923	13 23 38.4	9.142	9	11 47 5.55	2.2830	4 47 17.2	11.881
10	9 57 23.25	2.3899	13 14 27.3	9.228	10	11 49 22.48	2.2812	4 35 23.6	11.905
11	9 59 46.57	2.3875	13 5 11.1	9.313	11	11 51 39.30	2.2795	4 23 28.6	11.929
12	10 2 9.75	2.3852	12 55 49.8	9.397	12	11 53 56.02	2.2778	4 11 32.1	11.952
13	10 4 32.79	2.3828	12 46 23.5	9.480	13	11 56 12.64	2.2762	3 59 34.3	11.973
14	10 6 55.68	2.3804	12 36 52.2	9.562	14	11 58 29.16	2.2745	3 47 35.3	11.992
15	10 9 18.43	2.3780	12 27 16.1	9.642	15	12 0 45.58	2.2729	3 35 35.2	12.011
16	10 11 41.04	2.3756	12 17 35.2	9.722	16	12 3 1.91	2.2713	3 23 34.0	12.029
17	10 14 3.50	2.3731	12 7 49.5	9.800	17	12 5 18.14	2.2697	3 11 31.7	12.046
18	10 16 25.81	2.3707	11 57 59.2	9.877	18	12 7 34.28	2.2682	2 59 28.5	12.060
19	10 18 47.98	2.3682	11 48 4.3	9.953	19	12 9 50.33	2.2668	2 47 24.5	12.073
20	10 21 10.00	2.3657	11 38 4.9	10.027	20	12 12 6.30	2.2655	2 35 19.7	12.086
21	10 23 31.87	2.3633	11 28 1.1	10.099	21	12 14 22.19	2.2642	2 23 14.2	12.097
22	10 25 53.60	2.3609	11 17 53.0	10.171	22	12 16 38.00	2.2628	2 11 8.1	12.107
23	10 28 15.18	2.3584	11 7 40.5	10.243	23	12 18 53.73	2.2615	1 59 1.4	12.115
24	10 30 36.61	2.3559	N.10 57 23.8	10.312	24	12 21 9.38	2.2603	N. 1 46 54.3	12.122

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 21 9.38	2.2603	N. 1 46 54.3	12.122
1	12 23 24.96	2.2591	1 34 46.8	12.127
2	12 25 40.47	2.2579	1 22 39.0	12.132
3	12 27 55.91	2.2568	1 10 31.0	12.135
4	12 30 11.29	2.2557	0 58 22.8	12.137
5	12 32 26.60	2.2547	0 46 14.5	12.138
6	12 34 41.85	2.2537	0 34 6.2	12.137
7	12 36 57.05	2.2528	0 21 58.0	12.136
8	12 39 12.19	2.2518	N. 0 9 49.9	12.133
9	12 41 27.27	2.2509	S. 0 2 18.0	12.129
10	12 43 42.30	2.2501	0 14 25.6	12.123
11	12 45 57.29	2.2494	0 26 32.8	12.116
12	12 48 12.23	2.2487	0 38 39.5	12.108
13	12 50 27.13	2.2480	0 50 45.7	12.099
14	12 52 41.99	2.2473	1 2 51.4	12.089
15	12 54 56.81	2.2467	1 14 56.4	12.077
16	12 57 11.60	2.2462	1 27 0.6	12.064
17	12 59 26.35	2.2456	1 39 4.1	12.051
18	13 1 41.07	2.2452	1 51 6.7	12.036
19	13 3 55.77	2.2447	2 3 8.4	12.019
20	13 6 10.44	2.2443	2 15 9.0	12.001
21	13 8 25.09	2.2440	2 27 8.5	11.982
22	13 10 39.72	2.2437	2 39 6.9	11.962
23	13 12 54.33	2.2434	S. 2 51 4.0	11.940

TUESDAY 26

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 15 8.93	2.2432	S. 3 2 59.7	11.917
1	13 17 23.52	2.2431	3 14 54.0	11.894
2	13 19 38.10	2.2429	3 26 47.0	11.871
3	13 21 52.67	2.2428	3 38 38.5	11.845
4	13 24 7.24	2.2428	3 50 28 4	11.817
5	13 26 21.81	2.2427	4 2 16.6	11.789
6	13 28 36.37	2.2428	4 14 3.1	11.760
7	13 30 50.94	2.2429	4 25 47.8	11.729
8	13 33 5.52	2.2430	4 37 30.6	11.697
9	13 35 20.10	2.2431	4 49 11.5	11.665
10	13 37 34.69	2.2433	5 0 50.4	11.631
11	13 39 49.30	2.2436	5 12 27.2	11.596
12	13 42 3.93	2.2439	5 24 1.9	11.560
13	13 44 18.57	2.2442	5 35 34.4	11.522
14	13 46 33.23	2.2446	5 47 4.6	11.484
15	13 48 47.92	2.2450	5 58 32.5	11.445
16	13 51 2.63	2.2454	6 9 58.0	11.404
17	13 53 17.37	2.2458	6 21 21.0	11.362
18	13 55 32.13	2.2462	6 32 41.5	11.320
19	13 57 46.92	2.2468	6 43 59.4	11.276
20	14 0 1.75	2.2475	6 55 14.6	11.231
21	14 2 16.62	2.2481	7 6 27.1	11.185
22	14 4 31.52	2.2487	7 17 36.8	11.137
23	14 6 46.46	2.2494	7 28 43.6	11.089
24	14 9 1.45	2.2502	S. 7 39 47.5	11.040

WEDNESDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 9 1.45	2.2502	S. 7 39 47.5	11.040
1	14 11 16.48	2.2509	7 50 48.4	10.990
2	14 13 31.56	2.2517	8 1 46.3	10.939
3	14 15 46.68	2.2524	8 12 41.1	10.887
4	14 18 1.85	2.2533	8 23 32.7	10.833
5	14 20 17.08	2.2542	8 34 21.0	10.778
6	14 22 32.36	2.2552	8 45 6.1	10.723
7	14 24 47.70	2.2561	8 55 47.8	10.667
8	14 27 3.09	2.2570	9 6 26.1	10.609
9	14 29 18.54	2.2580	9 17 0.9	10.551
10	14 31 34.05	2.2590	9 27 32.2	10.492
11	14 33 49.62	2.2601	9 37 59.9	10.431
12	14 36 5.26	2.2612	9 48 23.9	10.369
13	14 38 20.96	2.2623	9 58 44.2	10.307
14	14 40 36.73	2.2634	10 9 0.7	10.243
15	14 42 52.57	2.2645	10 19 13.4	10.179
16	14 45 8.47	2.2657	10 29 22.2	10.113
17	14 47 24.45	2.2669	10 39 27.0	10.047
18	14 49 40.50	2.2681	10 49 27.8	9.979
19	14 51 56.62	2.2693	10 59 24.5	9.911
20	14 54 12.82	2.2706	11 9 17.1	9.842
21	14 56 29.09	2.2718	11 19 5.6	9.772
22	14 58 45.44	2.2731	11 28 49.8	9.701
23	15 1 1.86	2.2743	S. 11 38 29.7	9.629

THURSDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 3 18.36	2.2756	S. 11 48 5.3	9.557
1	15 5 34.94	2.2770	11 57 36.5	9.483
2	15 7 51.60	2.2783	12 7 3.2	9.408
3	15 10 8.34	2.2797	12 16 25.4	9.332
4	15 12 25.16	2.2811	12 25 43.0	9.255
5	15 14 42.07	2.2825	12 34 56.0	9.177
6	15 16 59.06	2.2838	12 44 4.3	9.099
7	15 19 16.13	2.2852	12 53 7.9	9.020
8	15 21 33.29	2.2866	13 2 6.7	8.940
9	15 23 50.53	2.2880	13 11 0.7	8.859
10	15 26 7.85	2.2894	13 19 49.8	8.777
11	15 28 25.26	2.2908	13 28 34.0	8.695
12	15 30 42.75	2.2922	13 37 13.2	8.612
13	15 33 0.33	2.2937	13 45 47.4	8.528
14	15 35 17.99	2.2951	13 54 16.5	8.443
15	15 37 35.74	2.2965	14 2 40.5	8.358
16	15 39 53.57	2.2979	14 10 59.4	8.271
17	15 42 11.49	2.2994	14 19 13.0	8.183
18	15 44 29.50	2.3008	14 27 21.3	8.094
19	15 46 47.59	2.3022	14 35 24.3	8.006
20	15 49 5.76	2.3036	14 43 22.0	7.916
21	15 51 24.02	2.3050	14 51 14.2	7.825
22	15 53 42.36	2.3063	14 59 1.0	7.734
23	15 56 0.78	2.3077	15 6 42.3	7.642
24	15 58 19.29	2.3091	S. 15 14 18.1	7.550

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 58 19.29	2.3091	S. 15 14 18.1	7.550
1	16 0 37.88	2.3105	15 21 48.3	7.457
2	16 2 56.55	2.3118	15 29 12.9	7.362
3	16 5 15.30	2.3132	15 36 31.8	7.267
4	16 7 34.13	2.3145	15 43 45.0	7.172
5	16 9 53.04	2.3158	15 50 52.4	7.076
6	16 12 12.03	2.3171	15 57 54.1	6.980
7	16 14 31.10	2.3184	16 4 50.0	6.882
8	16 16 50.24	2.3196	16 11 40.0	6.783
9	16 19 9.45	2.3207	16 18 24.0	6.684
10	16 21 28.73	2.3220	16 25 2.1	6.585
11	16 23 48.09	2.3232	16 31 34.2	6.485
12	16 26 7.52	2.3244	16 38 0.3	6.384
13	16 28 27.02	2.3256	16 44 20.3	6 283
14	16 30 46.59	2.3267	16 50 34.3	6.182
15	16 33 6.22	2.3277	16 56 42.2	6.080
16	16 35 25.92	2.3288	17 2 43.9	5.977
17	16 37 45.68	2.3298	17 8 39.4	5.873
18	16 40 5.50	2.3308	17 14 28.7	5.769
19	16 42 25.38	2.3318	17 20 11.7	5.665
20	16 44 45.32	2.3327	17 25 48.5	5.561
21	16 47 5.31	2.3336	17 31 19.0	5.455
22	16 49 25.35	2.3345	17 36 43.1	5.348
23	16 51 45.45	2.3354	S. 17 42 0.8	5.242

SATURDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	16 54 5.60	2.3362	S. 17 47 12.2	5.136
1	16 56 25.79	2.3369	17 52 17.1	5.029
2	16 58 46.03	2.3376	17 57 15.6	4.921
3	17 1 6.31	2.3383	18 2 7.6	4.812
4	17 3 26.63	2.3390	18 6 53.1	4.704
5	17 5 46.99	2.3397	18 11 32.1	4.595
6	17 8 7.39	2.3403	18 16 4.5	4.486
7	17 10 27.82	2.3408	18 20 30.4	4.377
8	17 12 48.28	2.3412	18 24 49.7	4.267
9	17 15 8.76	2.3416	18 29 2.4	4.157
10	17 17 29.27	2.3420	18 33 8.5	4.046
11	17 19 49.80	2.3423	18 37 7.9	3.934
12	17 22 10.35	2.3426	18 41 0.6	3.823
13	17 24 30.92	2.3429	18 44 46.6	3.712
14	17 26 51.50	2.3431	18 48 26.0	3.601
15	17 29 12.09	2.3432	18 51 58.7	3.489
16	17 31 32.69	2.3433	18 55 24.6	3.376
17	17 33 53.29	2.3434	18 58 43.8	3.264
18	17 36 13.90	2.3435	19 1 56.3	3.151
19	17 38 34.51	2.3434	19 5 2.0	3.038
20	17 40 55.11	2.3433	19 8 0.9	2.925
21	17 43 15.71	2.3432	19 10 53.0	2.812
22	17 45 36.30	2.3430	19 13 38.3	2.698
23	17 47 56.87	2.3427	19 16 16.8	2.585
24	17 50 17.42	2.3423	S. 19 18 48.5	2.472

SUNDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 50 17.42	2.3423	S. 19 18 48.5	2.472
1	17 52 37.95	2.3420	19 21 13.4	2.358
2	17 54 58.46	2.3417	19 23 31.5	2.244
3	17 57 18.95	2.3413	19 25 42.7	2.130
4	17 59 39.41	2.3407	19 27 47.1	2.016
5	18 1 59.83	2.3401	19 29 44.7	1.902
6	18 4 20.22	2.3395	19 31 35.4	1.788
7	18 6 40.57	2.3388	19 33 19.3	1.675
8	18 9 0.87	2.3380	19 34 56.4	1.561
9	18 11 21.13	2.3372	19 36 26.6	1.447
10	18 13 41.34	2.3364	19 37 50.0	1.333
11	18 16 1.50	2.3355	19 39 6.6	1.219
12	18 18 21.60	2.3345	19 40 16.8	1.105
13	18 20 41.64	2.3335	19 41 19.2	0.992
14	18 23 1.62	2.3324	19 42 15.3	0.878
15	18 25 21.53	2.3312	19 43 4.6	0.764
16	18 27 41.37	2.3300	19 43 47.0	0.651
17	18 30 1.13	2.3288	19 44 22.7	8.538
18	18 32 20.82	2.3275	19 44 51.6	0.425
19	18 34 40.43	2.3261	19 45 13.7	0.312
20	18 36 59.95	2.3246	19 45 29.1	0.200
21	18 39 19.38	2.3232	19 45 37.7	−0.087
22	18 41 38.73	2.3216	19 45 39.6	+0.025
23	18 43 57.98	2.3200	S. 19 45 34.7	0.137

MONDAY, AUGUST 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 46 17.13	2.3183	S. 19 45 23.1	0.249

PHASES OF THE MOON.

		d	h	m
○ Full Moon	July	4	20	34.1
☾ Last Quarter		12	18	57.0
● New Moon		20	8	50.0
☽ First Quarter		27	2	30.3

		d	h
☾ Apogee	July	11	18.5
☾ Perigee		23	18.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Sun	W.	130° 32′ 4″	2654	132° 9′ 46″	2660	133° 47′ 20″	2665	135° 24′ 47″	2671
	Venus	W.	85 34 58	2665	87 12 25	2669	88 49 46	2674	90 27 1	2679
	Regulus	W.	81 44 51	2336	83 29 58	2341	85 14 58	2346	86 59 51	2350
	Spica	W.	28 38 16	2460	30 20 26	2451	32 2 48	2445	33 45 18	2442
	α Aquilæ	E.	70 12 39	2941	68 41 12	2960	67 10 9	2980	65 39 31	3002
	Fomalhaut	E.	103 16 55	2618	101 38 25	2619	99 59 56	2621	98 21 29	2623
2	Venus	W.	98 31 27	2708	100 7 56	2714	101 44 17	2721	103 20 29	2728
	Regulus	W.	95 42 24	2378	97 26 30	2384	99 10 27	2391	100 54 14	2398
	Spica	W.	42 18 30	2441	44 1 7	2443	45 43 40	2447	47 26 8	2451
	α Aquilæ	E.	58 14 17	3151	56 47 9	3188	55 20 46	3230	53 55 12	3274
	Fomalhaut	E.	90 10 22	2646	88 32 29	2652	86 54 45	2660	85 17 11	2669
3	Spica	W.	55 56 52	2477	57 38 37	2484	59 20 13	2491	61 1 39	2498
	α Aquilæ	E.	47 1 58	3568	45 42 49	3646	44 25 4	3731	43 8 50	3825
	Fomalhaut	E.	77 12 26	2719	75 36 12	2732	74 0 15	2745	72 24 35	2760
	α Pegasi	E.	92 17 23	2767	90 42 12	2775	89 7 12	2785	87 32 24	2795
4	Spica	W.	69 26 3	2541	71 6 19	2550	72 46 23	2560	74 26 13	2569
	Antares	W.	24 44 56	2848	26 18 21	2821	27 52 22	2799	29 26 51	2783
	Fomalhaut	E.	64 31 21	2845	62 57 51	2865	61 24 47	2887	59 52 11	2909
	α Pegasi	E.	79 41 51	2853	78 8 32	2868	76 35 32	2883	75 2 52	2900
5	Spica	W.	82 41 54	2623	84 20 18	2634	85 58 27	2646	87 36 20	2657
	Antares	W.	37 22 59	2753	38 58 29	2753	40 33 59	2754	42 9 27	2757
	Fomalhaut	E.	52 17 1	3047	50 47 46	3080	49 19 12	3115	47 51 21	3153
	α Pegasi	E.	67 25 0	2993	65 54 39	3015	64 24 45	3039	62 55 20	3063
6	Spica	W.	95 41 50	2717	97 18 7	2729	98 54 8	2741	100 29 53	2754
	Antares	W.	50 5 18	2787	51 40 3	2795	53 14 38	2803	54 49 2	2811
	Fomalhaut	E.	40 44 47	3397	39 22 27	3460	38 1 18	3529	36 41 26	3605
	α Pegasi	E.	55 36 13	3206	54 10 11	3239	52 44 48	3275	51 20 7	3313
	α Arietis	E.	97 43 10	2840	96 9 34	2852	94 36 13	2862	93 3 6	2875
7	Antares	W.	62 38 7	2859	64 11 18	2869	65 44 17	2879	67 17 3	2889
	α Pegasi	E.	44 28 45	3548	43 9 14	3607	41 50 47	3671	40 33 29	3740
	α Arietis	E.	85 21 25	2937	83 49 53	2950	82 18 37	2962	80 47 37	2976
8	Antares	W.	74 57 36	2940	76 29 4	2950	78 0 19	2961	79 31 21	2970
	α Aquilæ	W.	36 52 15	4752	37 52 31	4635	38 54 26	4530	39 57 52	4437
	α Arietis	E.	73 16 48	3043	71 47 29	3057	70 18 27	3072	68 49 43	3086
	Aldebaran	E.	104 58 12	2877	103 25 24	2888	101 52 50	2898	100 20 29	2909
9	Antares	W.	87 3 31	3018	88 33 22	3026	90 3 2	3035	91 32 31	3043
	α Aquilæ	W.	45 33 14	4103	46 43 13	4055	47 53 58	4013	49 5 25	3974
	α Arietis	E.	61 30 23	3158	60 3 24	3174	58 36 44	3189	57 10 22	3205
	Aldebaran	E.	92 41 58	2958	91 10 52	2967	89 39 58	2976	88 9 15	2984
	Sun	E.	131 31 50	3322	130 8 4	3331	128 44 28	3340	127 21 3	3349
10	α Aquilæ	W.	55 11 10	3830	56 25 41	3809	57 40 34	3789	58 55 48	3770
	α Arietis	E.	50 3 22	3291	48 39 0	3310	47 15 0	3329	45 51 22	3350
	Aldebaran	E.	80 38 5	3020	79 8 17	3026	77 38 37	3032	76 9 4	3038

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}.	P. L. of Diff.	XVIII^{h}.	P. L. of Diff.	XXI^{h}.	P. L. of Diff.
1	**Sun**	W.	137° 2′ 6″	2677	138° 39′ 16″	2683	140° 16′ 18″	2691	141° 53′ 10″	2698
	Venus	W.	92 4 9	2684	93 41 10	2690	95 18 3	2696	96 54 49	2701
	Regulus	W.	88 44 37	2355	90 29 16	2361	92 13 47	2366	93 58 10	2373
	Spica	W.	35 27 53	2440	37 10 31	2438	38 53 11	2438	40 35 51	2439
	α Aquilæ	E.	64 9 21	3027	62 39 42	3054	61 10 36	3084	59 42 7	3116
	Fomalhaut	E.	96 43 5	2626	95 4 45	2630	93 26 31	2635	91 48 23	2640
2	**Venus**	W.	104 56 32	2735	106 32 25	2743	108 8 8	2751	109 43 40	2759
	Regulus	W.	102 37 51	2405	104 21 18	2412	106 4 35	2419	107 47 42	2427
	Spica	W.	49 8 30	2455	50 50 46	2460	52 32 56	2465	54 14 58	2471
	α Aquilæ	E.	52 30 30	3323	51 6 45	3376	49 44 1	3435	48 22 24	3498
	Fomalhaut	E.	83 39 49	2678	82 2 39	2687	80 25 41	2696	78 48 56	2707
3	Spica	W.	62 42 55	2506	64 24 0	2515	66 4 53	2523	67 45 34	2532
	α Aquilæ	E.	41 54 14	3929	40 41 24	4044	39 30 28	4173	38 21 36	4317
	Fomalhaut	E.	70 49 14	2775	69 14 13	2791	67 39 33	2808	66 5 15	2826
	α Pegasi	E.	85 57 49	2805	84 23 27	2815	82 49 19	2828	81 15 27	2840
4	Spica	W.	76 5 50	2580	77 45 13	2591	79 24 21	2601	81 3 15	2612
	Antares	W.	31 1 41	2771	32 36 47	2762	34 12 5	2756	35 47 30	2753
	Fomalhaut	E.	58 20 4	2934	56 48 28	2959	55 17 24	2986	53 46 54	3016
	α Pegasi	E.	73 30 33	2916	71 58 35	2934	70 26 59	2953	68 55 47	2973
5	Spica	W.	89 13 58	2669	90 51 20	2681	92 28 26	2692	94 5 16	2704
	Antares	W.	43 44 51	2762	45 20 9	2767	46 55 20	2773	48 30 23	2779
	Fomalhaut	E.	46 24 16	3195	44 58 1	3240	43 32 39	3288	42 8 13	3339
	α Pegasi	E.	61 26 25	3088	59 58 1	3115	58 30 10	3143	57 2 53	3174
6	Spica	W.	102 5 21	2766	103 40 33	2779	105 15 28	2792	106 50 6	2805
	Antares	W.	56 23 15	2820	57 57 17	2830	59 31 6	2839	61 4 43	2849
	Fomalhaut	E.	35 22 57	3690	34 5 59	3785	32 50 41	3891	31 37 12	4012
	α Pegasi	E.	49 56 11	3354	48 33 2	3397	47 10 42	3444	45 49 15	3495
	α Arietis	E.	91 30 15	2887	89 57 39	2898	88 25 18	2911	86 53 13	2924
7	Antares	W.	68 49 36	2899	70 21 56	2910	71 54 2	2920	73 25 55	2930
	α Pegasi	E.	39 17 24	3816	38 2 38	3899	36 49 17	3990	35 37 28	4093
	α Arietis	E.	79 16 54	2989	77 46 27	3002	76 16 17	3016	74 46 24	3030
8	Antares	W.	81 2 11	2980	82 32 49	2989	84 3 15	2999	85 33 29	3009
	α Aquilæ	W.	41 2 40	4354	42 8 43	4280	43 15 54	4215	44 24 6	4156
	α Arietis	E.	67 21 16	3100	65 53 6	3114	64 25 14	3129	62 57 40	3143
	Aldebaran	E.	98 48 21	2919	97 16 26	2929	95 44 44	2939	94 13 15	2949
9	Antares	W.	93 1 50	3052	94 30 59	3060	95 59 58	3067	97 28 48	3075
	α Aquilæ	W.	50 17 30	3939	51 30 10	3908	52 43 22	3879	53 57 3	3854
	α Arietis	E.	55 44 19	3221	54 18 35	3237	52 53 10	3254	51 28 5	3273
	Aldebaran	E.	86 38 42	2992	85 8 19	2999	83 38 5	3007	82 8 1	3014
	Sun	E.	125 57 48	3357	124 34 42	3365	123 11 46	3373	121 48 59	3380
10	α Aquilæ	W.	60 11 21	3753	61 27 12	3738	62 43 19	3725	63 59 40	3711
	α Arietis	E.	44 28 8	3372	43 5 20	3396	41 42 58	3421	40 21 5	3447
	Aldebaran	E.	74 39 38	3043	73 10 18	3047	71 41 4	3052	70 11 55	3055

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
10	Sun	E.	120° 26′ 20″	3387	119° 3′ 49″	3393	117° 41′ 25″	3400	116° 19′ 8″	3405
11	α Aquilæ	W.	65 16 15	3699	66 33 3	3687	67 50 4	3677	69 7 16	3666
	Fomalhaut	W.	31 42 11	4184	32 50 52	4101	34 0 53	4026	35 12 7	3959
	α Arietis	E.	38 59 42	3476	37 38 51	3508	36 18 36	3545	34 59 1	3584
	Aldebaran	E.	68 42 50	3059	67 13 50	3061	65 44 53	3064	64 15 59	3065
	Mars	E.	90 4 28	3327	88 40 48	3330	87 17 11	3332	85 53 37	3334
	Sun	E.	109 29 8	3427	108 7 22	3430	106 45 39	3432	105 23 59	3433
12	α Aquilæ	W.	75 35 48	3623	76 53 57	3615	78 12 15	3608	79 30 41	3601
	Fomalhaut	W.	41 22 55	3714	42 39 27	3678	43 56 37	3645	45 14 23	3614
	Aldebaran	E.	56 51 51	3069	55 23 3	3067	53 54 13	3065	52 25 21	3064
	Mars	E.	78 56 9	3337	77 32 40	3337	76 9 11	3335	74 45 40	3332
	Sun	E.	98 35 58	3437	97 14 23	3435	95 52 46	3433	94 31 7	3431
13	Fomalhaut	W.	51 50 53	3487	53 11 32	3465	54 32 35	3444	55 54 2	3424
	α Pegasi	W.	38 57 4	3985	40 8 58	3924	41 21 53	3868	42 35 45	3817
	Aldebaran	E.	45 0 17	3047	43 31 2	3043	42 1 42	3038	40 32 16	3031
	Mars	E.	67 47 17	3316	66 23 24	3311	64 59 25	3306	63 35 20	3300
	Sun	E.	87 42 6	3413	86 20 4	3408	84 57 56	3402	83 35 42	3395
14	Fomalhaut	W.	62 46 37	3334	64 10 9	3317	65 34 1	3300	66 58 12	3283
	α Pegasi	W.	48 57 20	3607	50 15 47	3572	51 34 52	3540	52 54 32	3508
	Aldebaran	E.	33 3 6	2997	31 32 49	2988	30 2 21	2979	28 31 42	2970
	Mars	E.	56 33 6	3265	55 8 13	3257	53 43 11	3247	52 17 58	3238
	Sun	E.	76 42 32	3357	75 19 26	3348	73 56 10	3338	72 32 43	3328
15	Fomalhaut	W.	74 3 53	3204	75 29 57	3189	76 56 19	3173	78 23 0	3158
	α Pegasi	W.	59 41 8	3371	61 3 58	3345	62 27 17	3321	63 51 4	3298
	Mars	E.	45 9 3	3188	43 42 40	3177	42 16 3	3166	40 49 13	3154
	Sun	E.	65 32 23	3271	64 7 38	3259	62 42 39	3247	61 17 25	3233
16	Fomalhaut	W.	85 41 0	3083	87 9 30	3069	88 38 18	3054	90 7 24	3039
	α Pegasi	W.	70 56 35	3189	72 22 57	3169	73 49 43	3149	75 16 53	3130
	α Arietis	W.	27 53 46	3576	29 12 47	3489	30 33 23	3415	31 55 23	3347
	Mars	E.	33 31 36	3097	32 3 23	3087	30 34 57	3075	29 6 17	3065
	Sun	E.	54 7 11	3163	52 40 17	3148	51 13 6	3133	49 45 36	3118
17	Fomalhaut	W.	97 37 14	2972	99 8 2	2959	100 39 6	2947	102 10 25	2935
	α Arietis	W.	39 2 40	3091	40 31 1	3051	42 0 11	3013	43 30 8	2978
	Sun	E.	42 23 23	3039	40 53 58	3022	39 24 13	3006	37 54 8	2991
18	α Arietis	W.	51 10 9	2828	52 44 1	2802	54 18 26	2777	55 53 24	2753
	Aldebaran	W.	17 13 3	2580	18 52 26	2564	20 32 10	2548	22 12 16	2533
	Sun	E.	30 18 44	2912	28 46 40	2896	27 14 16	2880	25 41 32	2866
22	Sun	W.	21 35 0	2533	23 15 28	2525	24 56 6	2519	26 36 53	2514
	Spica	E.	61 24 14	2259	59 37 14	2256	57 50 9	2253	56 3 1	2251
	Jupiter	E.	66 19 43	2256	64 32 38	2251	62 45 27	2247	60 58 10	2244
	Antares	E.	107 15 33	2285	105 29 11	2279	103 42 40	2274	101 56 2	2269
23	Sun	W.	35 2 21	2496	36 43 40	2494	38 25 1	2493	40 6 24	2493

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
10	**Sun**	E.	114° 56′ 57″	3410	113° 34′ 52″	3415	112° 12′ 53″	3419	110° 50′ 58″	3423
11	α Aquilæ	W.	70 24 39	3657	71 42 12	3648	72 59 55	3639	74 17 47	3631
	Fomalhaut	W.	36 24 27	3900	37 37 47	3847	38 52 1	3798	40 7 5	3754
	α Arietis	E.	33 40 9	3696	32 22 3	3675	31 4 49	3730	29 48 34	3793
	Aldebaran	E.	62 47 7	3067	61 18 17	3068	59 49 28	3068	58 20 39	3069
	Mars	E.	84 30 5	3336	83 6 35	3337	81 43 6	3337	80 19 37	3338
	Sun	E.	104 2 20	3435	102 40 43	3436	101 19 7	3437	99 57 32	3438
12	α Aquilæ	W.	80 49 14	3594	82 7 55	3587	83 26 43	3581	84 45 38	3575
	Fomalhaut	W.	46 32 42	3586	47 51 32	3559	49 10 51	3533	50 30 39	3509
	Aldebaran	E.	50 56 27	3061	49 27 30	3059	47 58 31	3056	46 29 26	3052
	Mars	E.	73 22 6	3330	71 58 29	3327	70 34 49	3324	69 11 5	3320
	Sun	E.	93 9 26	3429	91 47 42	3425	90 25 54	3422	89 4 2	3418
13	Fomalhaut	W.	57 15 51	3405	58 38 2	3387	60 0 33	3369	61 23 25	3351
	α Pegasi	W.	43 50 30	3768	45 6 5	3724	46 22 27	3682	47 39 33	3644
	Aldebaran	E.	39 2 42	3026	37 33 1	3018	36 3 11	3012	34 33 13	3005
	Mars	E.	62 11 9	3294	60 46 51	3288	59 22 25	3280	57 57 50	3272
	Sun	E.	82 13 20	3389	80 50 51	3382	79 28 14	3374	78 5 28	3365
14	Fomalhaut	W.	68 22 43	3267	69 47 33	3252	71 12 41	3236	72 38 8	3220
	α Pegasi	W.	54 14 47	3478	55 35 36	3450	56 56 56	3423	58 18 47	3396
	Aldebaran	E.	27 0 52	2961	25 29 50	2950	23 58 35	2940	22 27 7	2929
	Mars	E.	50 52 34	3229	49 26 59	3220	48 1 13	3209	46 35 14	3198
	Sun	E.	71 9 4	3318	69 45 13	3307	68 21 10	3295	66 56 53	3284
15	Fomalhaut	W.	79 50 0	3143	81 17 18	3128	82 44 54	3113	84 12 48	3098
	α Pegasi	W.	65 15 18	3275	66 39 59	3253	68 5 6	3231	69 30 38	3210
	Mars	E.	39 22 9	3143	37 54 51	3132	36 27 20	3120	34 59 35	3109
	Sun	E.	59 51 55	3220	58 26 9	3206	57 0 7	3192	55 33 48	3177
16	Fomalhaut	W.	91 36 48	3026	93 6 29	3012	94 36 27	2998	96 6 42	2985
	α Pegasi	W.	76 44 26	3110	78 12 23	3092	79 40 42	3073	81 9 24	3056
	α Arietis	W.	33 18 40	3287	34 43 7	3231	36 8 39	3181	37 35 11	3133
	Mars	E.	27 37 25	3056	26 8 21	3047	24 39 6	3039	23 9 42	3034
	Sun	E.	48 17 48	3102	46 49 41	3086	45 21 14	3070	43 52 28	3055
17	Fomalhaut	W.	103 42 0	2924	105 13 49	2912	106 45 52	2902	108 18 8	2892
	α Arietis	W.	45 0 48	2945	46 32 10	2913	48 4 12	2883	49 36 52	2855
	Sun	E.	36 23 44	2974	34 52 59	2958	33 21 54	2942	31 50 29	2927
18	α Arietis	W.	57 28 54	2730	59 4 54	2708	60 41 23	2687	62 18 20	2666
	Aldebaran	W.	23 52 43	2518	25 33 31	2504	27 14 39	2489	28 56 8	2475
	Sun	E.	24 8 29	2852	22 35 8	2838	21 1 30	2825	19 27 35	2813
22	**Sun**	W.	28 17 47	2509	29 58 48	2505	31 39 54	2502	33 21 5	2498
	Spica	E.	54 15 50	2250	52 28 37	2249	50 41 23	2250	48 54 10	2251
	Jupiter	E.	59 10 48	2241	57 23 22	2239	55 35 53	2237	53 48 21	2236
	Antares	E.	100 9 17	2265	98 22 26	2262	96 35 30	2259	94 48 30	2256
23	**Sun**	W.	41 47 47	2492	43 29 11	2492	45 10 35	2493	46 51 58	2494

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
23	Spica	E.	47° 6′ 58″	2252	45° 19′ 48″	2255	43° 32′ 42″	2259	41° 45′ 42″	2264
	Jupiter	E.	52 0 47	2235	50 13 12	2235	48 25 37	2236	46 38 2	2237
	Antares	E.	93 1 26	2254	91 14 19	2253	89 27 11	2253	87 40 2	2253
24	Sun	W.	48 33 19	2496	50 14 38	2497	51 55 55	2500	53 37 8	2503
	Regulus	W.	21 34 3	2197	23 22 35	2199	25 11 4	2202	26 59 29	2204
	Jupiter	E.	37 40 45	2249	35 53 31	2253	34 6 23	2259	32 19 23	2265
	Antares	E.	78 44 29	2260	76 57 30	2263	75 10 36	2266	73 23 47	2270
25	Sun	W.	62 2 7	2521	63 42 51	2526	65 23 28	2531	67 3 58	2537
	Regulus	W.	36 0 27	2222	37 48 22	2227	39 36 10	2231	41 23 51	2236
	Venus	W.	17 34 21	2543	19 14 35	2538	20 54 56	2535	22 35 20	2535
	Antares	E.	64 31 22	2297	62 45 18	2304	60 59 25	2312	59 13 43	2320
26	Sun	W.	75 24 33	2566	77 4 15	2572	78 43 48	2579	80 23 12	2585
	Regulus	W.	50 20 21	2264	52 7 14	2270	53 53 58	2277	55 40 32	2283
	Venus	W.	30 57 4	2545	32 37 14	2550	34 17 18	2556	35 57 15	2560
	Antares	E.	50 28 22	2368	48 44 2	2381	47 0 0	2394	45 16 17	2408
27	Sun	W.	88 37 48	2621	90 16 14	2629	91 54 29	2638	93 32 33	2645
	Regulus	W.	64 30 59	2317	66 16 34	2324	68 1 59	2331	69 47 13	2338
	Venus	W.	44 15 7	2590	45 54 16	2596	47 33 17	2603	49 12 8	2610
	Antares	E.	36 43 10	2498	35 1 54	2521	33 21 10	2547	31 41 2	2577
	α Aquilæ	E.	85 20 5	2842	83 46 32	2852	82 13 12	2864	80 40 7	2877
28	Sun	W.	101 40 16	2685	103 17 16	2693	104 54 5	2701	106 30 43	2709
	Regulus	W.	78 30 46	2375	80 14 56	2383	81 58 55	2391	83 42 43	2398
	Venus	W.	57 24 3	2645	59 1 57	2653	60 39 40	2660	62 17 13	2668
	Spica	W.	25 32 20	2533	27 12 47	2523	28 53 28	2516	30 34 19	2511
	Jupiter	W.	19 24 47	2487	21 6 19	2482	22 47 57	2480	24 29 38	2481
	α Aquilæ	E.	72 59 14	2957	71 28 7	2977	69 57 25	2997	68 27 9	3019
20	Sun	W.	114 31 9	2752	116 6 40	2760	117 42 0	2768	119 17 10	2776
	Venus	W.	70 22 24	2707	71 58 55	2714	73 35 16	2722	75 11 26	2731
	Spica	W.	38 59 21	2512	40 40 17	2515	42 21 9	2518	44 1 57	2522
	Jupiter	W.	32 57 14	2500	34 38 27	2505	36 19 33	2512	38 0 30	2517
	α Aquilæ	E.	61 3 22	3158	59 36 22	3191	58 10 2	3227	56 44 25	3266
	Fomalhaut	E.	93 23 48	2704	91 47 13	2710	90 10 47	2719	88 34 32	2727
30	Sun	W.	127 10 8	2821	128 44 9	2829	130 17 59	2838	131 51 38	2847
	Venus	W.	83 9 34	2772	84 44 39	2780	86 19 33	2788	87 54 17	2796
	Spica	W.	52 24 20	2548	54 4 26	2555	55 44 23	2561	57 24 11	2568
	Jupiter	W.	46 23 0	2552	48 3 1	2560	49 42 51	2567	51 22 31	2574
	α Aquilæ	E.	49 48 55	3513	48 28 45	3576	47 9 44	3645	45 51 58	3720
	Fomalhaut	E.	80 36 16	2776	79 1 17	2787	77 26 32	2799	75 52 3	2811
31	Venus	W.	95 45 9	2839	97 18 46	2848	98 52 12	2857	100 25 26	2866
	Spica	W.	65 40 50	2604	67 19 40	2611	68 58 20	2619	70 36 49	2626
	Jupiter	W.	59 38 11	2615	61 16 46	2623	62 55 10	2632	64 33 22	2640
	Antares	W.	21 20 5	3038	22 49 31	2985	24 20 3	2944	25 51 26	2912
	Fomalhaut	E.	68 3 54	2883	66 31 13	2899	64 58 53	2917	63 26 56	2935
	α Pegasi	E.	83 11 9	2909	81 39 2	2920	80 7 9	2932	78 35 31	2945

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV$^{\text{h}}$.	P. L. of Diff.	XVIII$^{\text{h}}$.	P. L. of Diff.	XXI$^{\text{h}}$.	P. L. of Diff.
23	Spica	E.	39° 58′ 49″	2269	38° 12′ 4″	2276	36° 25′ 29″	2284	34° 39′ 6″	2294
	Jupiter	E.	44 50 29	2238	43 2 58	2240	41 15 30	2242	39 28 5	2245
	Antares	E.	85 52 53	2253	84 5 45	2254	82 18 38	2255	80 31 32	2257
24	Sun	W.	55 18 17	2506	56 59 22	2510	58 40 22	2513	60 21 17	2517
	Regulus	W.	28 47 50	2207	30 36 7	2210	32 24 19	2214	34 12 26	2218
	Jupiter	E.	30 32 32	2272	28 45 51	2280	26 59 22	2290	25 13 8	2302
	Antares	E.	71 37 4	2274	69 50 27	2279	68 3 57	2285	66 17 35	2291
25	Sun	W.	68 44 20	2542	70 24 35	2547	72 4 43	2553	73 44 42	2559
	Regulus	W.	43 11 25	2241	44 58 51	2247	46 46 9	2252	48 33 19	2258
	Venus	W.	24 15 44	2535	25 56 8	2537	27 36 30	2539	29 16 49	2542
	Antares	E.	57 28 12	2328	55 42 54	2337	53 57 49	2347	52 12 58	2357
26	Sun	W.	82 2 27	2593	83 41 32	2600	85 20 27	2607	86 59 12	2614
	Regulus	W.	57 26 57	2289	59 13 12	2296	60 59 18	2302	62 45 14	2310
	Venus	W.	37 37 5	2566	39 16 47	2571	40 56 22	2577	42 35 49	2583
	Antares	E.	43 32 53	2422	41 49 50	2438	40 7 10	2457	38 24 56	2477
27	Sun	W.	95 10 27	2653	96 48 10	2660	98 25 43	2669	100 3 5	2677
	Regulus	W.	71 32 17	2346	73 17 10	2353	75 1 53	2360	76 46 25	2368
	Venus	W.	50 50 50	2617	52 29 22	2624	54 7 45	2630	55 45 59	2638
	Antares	E.	30 1 35	2611	28 22 55	2651	26 45 9	2696	25 8 24	2750
	α Aquilæ	E.	79 7 19	2891	77 34 48	2905	76 2 36	2921	74 30 44	2939
28	Sun	W.	108 7 11	2718	109 43 27	2726	111 19 32	2735	112 55 26	2743
	Regulus	W.	85 26 20	2406	87 9 46	2414	88 53 1	2422	90 36 5	2430
	Venus	W.	63 54 36	2675	65 31 49	2684	67 8 51	2691	68 45 43	2699
	Spica	W.	32 15 17	2508	33 56 19	2508	35 37 21	2509	37 18 22	2510
	Jupiter	W.	26 11 18	2483	27 52 55	2487	29 34 27	2490	31 15 54	2495
	α Aquilæ	E.	66 57 20	3043	65 28 1	3069	63 59 14	3096	62 31 0	3126
29	Sun	W.	120 52 9	2785	122 26 56	2795	124 1 31	2803	125 35 55	2811
	Venus	W.	76 47 25	2739	78 23 13	2747	79 58 51	2755	81 34 18	2763
	Spica	W.	45 42 40	2527	47 23 16	2532	49 3 45	2538	50 44 6	2543
	Jupiter	W.	39 41 19	2524	41 21 59	2531	43 2 29	2538	44 42 49	2545
	α Aquilæ	E.	55 19 34	3308	53 55 32	3353	52 32 22	3403	51 10 9	3455
	Fomalhaut	E.	86 58 28	2736	85 22 36	2745	83 46 56	2755	82 11 29	2766
30	Sun	W.	133 25 5	2855	134 58 21	2865	136 31 25	2874	138 4 17	2883
	Venus	W.	89 28 50	2805	91 3 12	2814	92 37 22	2822	94 11 21	2831
	Spica	W.	59 3 50	2574	60 43 20	2582	62 22 40	2589	64 1 50	2596
	Jupiter	W.	53 2 1	2583	54 41 20	2591	56 20 28	2599	57 59 25	2607
	α Aquilæ	E.	44 35 32	3801	43 20 31	3892	42 7 3	3992	40 55 16	4104
	Fomalhaut	E.	74 17 50	2825	72 43 54	2838	71 10 15	2852	69 36 55	2867
31	Venus	W.	101 58 29	2875	103 31 20	2884	105 3 59	2693	106 36 27	2902
	Spica	W.	72 15 8	2635	73 53 16	2643	75 31 13	2651	77 8 59	2660
	Jupiter	W.	66 11 23	2648	67 49 13	2657	69 26 51	2666	71 4 17	2674
	Antares	W.	27 23 30	2887	28 56 6	2868	30 29 6	2852	32 2 26	2841
	Fomalhaut	E.	61 55 22	2954	60 24 12	2974	58 53 27	2996	57 23 9	3019
	α Pegasi	E.	77 4 9	2958	75 33 4	2972	74 2 16	2987	72 31 47	3002

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to / Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	8 45 13.48	9.709	N.18 2 59.4	–37.70	15 48.04	66.66	6 5.85	0.147
Tues.	2	8 49 6.19	9.684	17 47 45.6	38.43	15 48.17	66.57	6 2.01	0.172
Wed.	3	8 52 58.29	9.659	17 32 14.6	39.14	15 48.30	66.49	5 57.56	0.197
Thur.	4	8 56 49.78	9.634	17 16 26.5	–39.85	15 48.44	66.40	5 52.50	0.222
Frid.	5	9 0 40.66	9.609	17 0 21.6	40.55	15 48.58	66.32	5 46.85	0.247
Sat.	6	9 4 30.95	9.584	16 44 0.2	41.23	15 48.72	66.23	5 40.61	0.272
SUN.	7	9 8 20.66	9.559	16 27 22.5	–41.90	15 48.86	66.14	5 33.78	0.296
Mon.	8	9 12 9.79	9.535	16 10 28.8	42.56	15 49.01	66.05	5 26.37	0.320
Tues.	9	9 15 58.35	9.512	15 53 19.5	43.21	15 49.16	65.97	5 18.40	0.343
Wed.	10	9 19 46.34	9.489	15 35 54.9	–43.84	15 49.31	65.88	5 9.87	0.366
Thur.	11	9 23 33.78	9.466	15 18 15.2	44.46	15 49.47	65.80	5 0.78	0.389
Frid.	12	9 27 20.67	9.443	15 0 20.8	45.07	15 49.63	65.72	4 51.15	0.412
Sat.	13	9 31 7.03	9.421	14 42 11.9	–45.67	15 49.79	65.64	4 40.98	0.434
SUN.	14	9 34 52.86	9.399	14 23 48.9	46.25	15 49.96	65.56	4 30.28	0.456
Mon.	15	9 38 38.16	9.377	14 5 12.1	46.82	15 50.13	65.48	4 19.06	0.478
Tues.	16	9 42 22.94	9.355	13 46 21.8	–47.38	15 50.31	65.41	4 7.32	0.500
Wed.	17	9 46 7.20	9.333	13 27 18.3	47.92	15 50.49	65.33	3 55.06	0.522
Thur.	18	9 49 50.96	9.312	13 8 2.0	48.44	15 50.68	65.25	3 42.30	0.543
Frid.	19	9 53 34.22	9.291	12 48 33.1	–48.96	15 50.87	65.18	3 29.05	0.564
Sat.	20	9 57 17.00	9.271	12 28 52.0	49.46	15 51.06	65.11	3 15.31	0.584
SUN.	21	10 0 59.30	9.252	12 8 59.1	49.95	15 51.26	65.04	3 1.08	0.603
Mon.	22	10 4 41.12	9.232	11 48 54.7	–50.42	15 51.47	64.97	2 46.38	0.622
Tues.	23	10 8 22.47	9.213	11 28 39.1	50.88	15 51.68	64.90	2 31.22	0.641
Wed.	24	10 12 3.36	9.195	11 8 12.5	51.33	15 51.89	64.84	2 15.61	0.659
Thur.	25	10 15 43.82	9.177	10 47 35.4	–51.76	15 52.11	64.78	1 59.56	0.677
Frid.	26	10 19 23.85	9.159	10 26 48.1	52.18	15 52.33	64.72	1 43.08	0.695
Sat.	27	10 23 3.47	9.142	10 5 50.9	52.59	15 52.55	64.66	1 26.18	0.712
SUN.	28	10 26 42.69	9.126	9 44 44.2	–52.98	15 52.77	64.61	1 8.89	0.728
Mon.	29	10 30 21.53	9.111	9 23 28.2	53.36	15 52.99	64.56	0 51.23	0.743
Tues.	30	10 34 0.00	9.096	9 2 3.3	53.72	15 53.22	64.51	0 33.21	0.758
Wed.	31	10 37 38.13	9.082	8 40 29.8	54.07	15 53.45	64.46	0 14.84	0.772
Thur.	32	10 41 15.94	9.069	N. 8 18 48.0	–54.41	15 53.68	64.42	0 3.85	0.785

Note.—The mean time of semidiameter passing may be found by subtracting $0^s.18$ from the sidereal time.
The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Mon.	1	8 45 12.49	9.709	N. 18 3 3.2	–37.70	6 5.86	0.147	8 39 6.64
Tues.	2	8 49 5.21	9.684	17 47 49.5	38.43	6 2.02	0.172	8 43 3.19
Wed.	3	8 52 57.32	9.659	17 32 18.5	39.14	5 57.57	0.197	8 46 59.75
Thur.	4	8 56 48.82	9.634	17 16 30.4	–39.85	5 52.52	0.222	8 50 56.30
Frid.	5	9 0 39.73	9.609	17 0 25.5	40.55	5 46.87	0.247	8 54 52.86
Sat.	6	9 4 30.04	9.584	16 44 4.1	41.23	5 40.63	0.272	8 58 49.41
SUN.	7	9 8 19.77	9.560	16 27 26.4	–41.90	5 33.80	0.296	9 2 45.97
Mon.	8	9 12 8.92	9.536	16 10 32.7	42.56	5 26.40	0.320	9 6 42.52
Tues.	9	9 15 57.50	9.513	15 53 23.4	43.21	5 18.43	0.343	9 10 39.07
Wed.	10	9 19 45.52	9.490	15 35 58.7	–43.84	5 9.90	0.366	9 14 35.62
Thur.	11	9 23 32.99	9.467	15 18 19.0	44.46	5 0.81	0.389	9 18 32.18
Frid.	12	9 27 19.91	9.444	15 0 24.5	45.07	4 51.18	0.412	9 22 28.73
Sat.	13	9 31 6.30	9.422	14 42 15.5	–45.67	4 41.01	0.434	9 26 25.29
SUN.	14	9 34 52.16	9.400	14 23 52.4	46.25	4 30.31	0.456	9 30 21.84
Mon.	15	9 38 37.49	9.378	14 5 15.5	46.82	4 19.09	0.478	9 34 18.40
Tues.	16	9 42 22.30	9.356	13 46 25.1	–47.38	4 7.35	0.500	9 38 14.95
Wed.	17	9 46 6.59	9.334	13 27 21.5	47.92	3 55.09	0.522	9 42 11.51
Thur.	18	9 49 50.39	9.313	13 8 5.0	48.45	3 42.33	0.543	9 46 8.06
Frid.	19	9 53 33.69	9.292	12 48 36.0	–48.97	3 29.07	0.564	9 50 4.62
Sat.	20	9 57 16.50	9.272	12 28 54.7	49.47	3 15.34	0.584	9 54 1.16
SUN.	21	10 0 58.83	9.253	12 9 1.6	49.96	3 1.11	0.603	9 57 57.72
Mon.	22	10 4 40.68	9.234	11 48 57.0	–50.43	2 46.41	0.622	10 1 54.27
Tues.	23	10 8 22.07	9.215	11 28 41.2	50.89	2 31.24	0.641	10 5 50.83
Wed.	24	10 12 3.01	9.197	11 8 14.4	51.34	2 15.63	0.659	10 9 47.38
Thur.	25	10 15 43.51	9.179	10 47 37.1	–51.77	1 59.58	0.677	10 13 43 93
Frid.	26	10 19 23.58	9.161	10 26 49.6	52.19	1 43.10	0.695	10 17 40.48
Sat.	27	10 23 3.24	9.144	10 5 52.2	52.60	1 26.20	0.712	10 21 37.04
SUN.	28	10 26 42.51	9.128	9 44 45.2	–52.99	1 8.91	0.728	10 25 33.59
Mon.	29	10 30 21.39	9.113	9 23 29.0	53.37	0 51.24	0.743	10 29 30.15
Tues.	30	10 33 59.91	9.098	9 2 3.9	53.73	0 33.21	0.758	10 33 26.70
Wed.	31	10 37 38.09	9.084	8 40 30.1	54.08	0 14.84	0.772	10 37 23.26
Thur.	32	10 41 15.95	9.071	N. 8 18 48.0	–54.42	0 3.85	0.785	10 41 19.80

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour,
+ 9ˢ.8565.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	213	128 52 29.0	52 9.9	143.52	+ 0.57	0.0063467	- 24.7	15 18 22.50
2	214	129 49 53.7	49 34.5	143.56	0.46	0.0062868	25.2	15 14 26.59
3	215	130 47 19.2	46 59.9	143.59	0.34	0.0062257	25.7	15 10 30.68
4	216	131 44 45.7	44 26.2	143.63	+ 0.21	0.0061633	- 26.2	15 6 34.77
5	217	132 42 13.2	41 53.6	143.67	+ 0.08	0.0060998	26.7	15 2 38.86
6	218	133 39 41.8	39 22.1	143.72	— 0.05	0.0060351	27.2	14 58 42.95
7	219	134 37 11.6	36 51.8	143.77	— 0.16	0.0059692	- 27.7	14 54 47.04
8	220	135 34 42.6	34 22.7	143.82	0.25	0.0059020	28.3	14 50 51.13
9	221	136 32 15.0	31 54.9	143.88	0.32	0.0058334	28.9	14 46 55.22
10	222	137 29 48.8	29 28.6	143.94	— 0.37	0.0057634	- 29.5	14 42 59.31
11	223	138 27 24.0	27 3.7	144.00	0.39	0.0056920	30.1	14 39 3.41
12	224	139 25 0.7	24 40.3	144.06	0.37	0.0056190	30.8	14 35 7.50
13	225	140 22 38.9	22 18.3	144.12	— 0.32	0.0055442	- 31.6	14 31 11.59
14	226	141 20 18.5	19 57.8	144.18	0.25	0.0054675	32.4	14 27 15.68
15	227	142 17 59.7	17 38.9	144.24	0.15	0.0053888	33.2	14 23 19.78
16	228	143 15 42.4	15 21.5	144.31	— 0.04	0.0053081	- 34.1	14 19 23.87
17	229	144 13 26.6	13 5.6	144.37	+ 0.09	0.0052253	34.9	14 15 27.96
18	230	145 11 12.2	10 51.1	144.43	0.22	0.0051404	35.8	14 11 32.06
19	231	146 8 59.2	8 37.9	144.49	+ 0.36	0.0050534	- 36.6	14 7 36.15
20	232	147 6 47.6	6 26.2	144.54	0.49	0.0049643	37.6	14 3 40.25
21	233	148 4 37.4	4 15.9	144.60	0.60	0.0048731	38.4	13 59 44.34
22	234	149 2 28.4	2 6.8	144.65	+ 0.69	0.0047800	- 39.2	13 55 48.43
23	235	150 0 20.7	59 59.0	144.71	0.75	0.0046851	39.9	13 51 52.52
24	236	150 58 14.3	57 52.5	144.76	0.78	0.0045884	40.6	13 47 56.61
25	237	151 56 9.1	55 47.2	144.81	+ 0.79	0.0044901	- 41.3	13 44 0.70
26	238	152 54 5.1	53 43.1	144.86	0.77	0.0043903	41.9	13 40 4.80
27	239	153 52 2.5	51 40.4	144.91	0.72	0.0042892	42.4	13 36 8.89
28	240	154 50 1.3	49 39.1	144.97	+ 0.64	0.0041870	- 42.8	13 32 12.98
29	241	155 48 1.4	47 39.1	145.03	0.53	0.0040838	43.2	13 28 17.07
30	242	156 46 2.9	45 40.5	145.09	0.42	0.0039798	43.5	13 24 21.17
31	243	157 44 5.9	43 43.4	145.15	0.29	0.0038750	43.8	13 20 25.27
32	244	158 42 10.3	41 47.7	145.22	+ 0.16	0.0037695	- 44.1	13 16 29.36

Note.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0ᵈ.0.

Diff. for 1 Hour,
— 9ˢ.8296.
(Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 30.5	15 26.4	56 48.1	−1.26	56 33.1	−1.26	10 29.7	2.21	11.6
2	15 22.3	15 18.2	56 18.0	1.25	56 3.1	1.23	11 21.9	2.15	12.6
3	15 14.2	15 10.3	55 48.4	1.21	55 34.0	1.17	12 12.1	2.04	13.6
4	15 6.6	15 3.0	55 20.2	−1.12	55 7.1	−1.06	13 0.0	1.94	14.6
5	14 59.6	14 56.6	54 54.8	0.98	54 43.5	0.89	13 45.5	1.85	15.6
6	14 53.8	14 51.5	54 33.4	0.78	54 24.8	0.65	14 29.2	1.79	16.6
7	14 49.6	14 48.1	54 17.8	−0.51	54 12.6	−0.35	15 11.7	1.75	17.6
8	14 47.3	14 46.9	54 9.3	−0.19	54 8.1	−0.01	15 53.5	1.75	18.6
9	14 47.2	14 48.1	54 9.1	+0.19	54 12.6	+0.39	16 35.5	1.77	19.6
10	14 49.7	14 52.0	54 18.4	+0.59	54 26.8	+0.80	17 18.5	1.82	20.6
11	14 55.0	14 58.6	54 37.7	1.01	54 51.0	1.22	18 3.2	1.91	21.6
12	15 2.9	15 7.9	55 6.9	1.42	55 25.1	1.61	18 50.2	2.02	22.6
13	15 13.4	15 19.5	55 45.4	+1.78	56 7.7	+1.93	19 40.1	2.14	23.6
14	15 26.0	15 32.9	56 31.7	2.06	56 57.0	2.15	20 32.9	2.26	24.6
15	15 40.0	15 47.3	57 23.2	2.21	57 49.9	2.22	21 28.2	2.35	25.6
16	15 54.5	16 1.6	58 16.4	+2.19	58 42.3	+2.11	22 25.1	2.39	26.6
17	16 8.3	16 14.5	59 6.9	1.97	59 29.6	1.79	23 22.6	2 39	27.6
18	16 20.0	16 24.6	59 49.8	1.56	60 7.0	1.29	δ		28.6
19	16 28.4	16 31.1	60 20.8	+1.00	60 30.9	+0.67	0 19.6	2.35	0.3
20	16 32.8	16 33.4	60 36.9	+0.34	60 39.0	+0.01	1 15.5	2.30	1.3
21	16 32.8	16 31.3	60 37.1	−0.32	60 31.4	−0.61	2 10.2	2.25	2.3
22	16 28.8	16 25.5	60 22.4	−0.88	60 10.3	−1.11	3 4.0	2.23	3.3
23	16 21.6	16 17.0	59 55.7	1.31	59 39.0	1.46	3 57.3	2.22	4.3
24	16 12.1	16 6.8	59 20.8	1.57	59 1.4	1.64	4 50.6	2.23	5.3
25	16 1.3	15 55.8	58 41.4	−1.68	58 21.0	−1.70	5 44.2	2.24	6.3
26	15 50.3	15 44.8	58 0.7	1.68	57 40.7	1.65	6 38.2	2.25	7.3
27	15 39.5	15 34.3	57 21.1	1.61	57 2.1	1.55	7 32.1	2.24	8.3
28	15 29.3	15 24.6	56 43.9	−1.48	56 26.5	−1.41	8 25.4	2.20	9.3
29	15 20.1	15 15.9	56 10.0	1.34	55 54.4	1.27	9 17.5	2.13	10.3
30	15 11.8	15 8.1	55 39.6	1.20	55 25.7	1.12	10 7.7	2.05	11.3
31	15 4.5	15 1.2	55 12.7	−1.05	55 0.6	−0.97	10 55.8	1.96	12.3
32	14 58.2	14 55.4	54 49.4	−0.89	54 39.2	−0.81	11 41.7	1.87	13.3

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 46 17.13	2.3183	S. 19 45 23.1	0.249
1	18 48 36.18	2.3166	19 45 4.8	0.361
2	18 50 55.13	2.3149	19 44 39.8	0.472
3	18 53 13.97	2.3131	19 44 8.2	0.582
4	18 55 32.70	2.3112	19 43 29.9	0.693
5	18 57 51.32	2.3093	19 42 45.0	0.804
6	19 0 9.82	2.3073	19 41 53.4	0.915
7	19 2 28.20	2.3052	19 40 55.2	1.024
8	19 4 46.45	2.3032	19 39 50.5	1.133
9	19 7 4.58	2.3011	19 38 39.3	1.242
10	19 9 22.58	2.2989	19 37 21.5	1.351
11	19 11 40.45	2.2967	19 35 57.2	1.459
12	19 13 58.18	2.2943	19 34 26.4	1.567
13	19 16 15.77	2.2920	19 32 49.2	1.674
14	19 18 33.22	2.2896	19 31 5.6	1.781
15	19 20 50.52	2.2872	19 29 15.5	1.888
16	19 23 7.68	2.2847	19 27 19.0	1.994
17	19 25 24.69	2.2822	19 25 16.2	2.099
18	19 27 41.54	2.2796	19 23 7.1	2.204
19	19 29 58.24	2.2770	19 20 51.7	2.309
20	19 32 14.78	2.2743	19 18 30.0	2.413
21	19 34 31.15	2.2715	19 16 2.1	2.517
22	19 36 47.36	2.2687	19 13 28.0	2.620
23	19 39 3.40	2.2660	S. 19 10 47.7	2.722

TUESDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 41 19.28	2.2632	S. 19 8 1.3	2.824
1	19 43 34.98	2.2603	19 5 8.8	2.926
2	19 45 50.51	2.2573	19 2 10.2	3.027
3	19 48 5.86	2.2543	18 59 5.6	3.127
4	19 50 21.03	2.2513	18 55 55.0	3.227
5	19 52 36.02	2.2482	18 52 38.4	3.327
6	19 54 50.82	2.2452	18 49 15.8	3.426
7	19 57 5.44	2.2421	18 45 47.3	3.523
8	19 59 19.87	2.2389	18 42 13.0	3.620
9	20 1 34.11	2.2357	18 38 32.9	3.717
10	20 3 48.16	2.2325	18 34 47.0	3.813
11	20 6 2.01	2.2293	18 30 55.4	3.908
12	20 8 15.67	2.2260	18 26 58.0	4.003
13	20 10 29.13	2.2226	18 22 55.0	4.097
14	20 12 42.38	2.2193	18 18 46.4	4.190
15	20 14 55.44	2.2160	18 14 32.2	4.283
16	20 17 8.30	2.2126	18 10 12.4	4.376
17	20 19 20.95	2.2091	18 5 47.1	4.467
18	20 21 33.39	2.2056	18 1 16.3	4.558
19	20 23 45.62	2.2021	17 56 40.1	4.648
20	20 25 57.64	2.1987	17 51 58.6	4.737
21	20 28 9.46	2.1952	17 47 11.7	4.826
22	20 30 21.06	2.1916	17 42 19.5	4.914
23	20 32 32.45	2.1880	17 37 22.1	5.001
24	20 34 43.62	2.1844	S. 17 32 19.4	5.087

WEDNESDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 34 43.62	2.1844	S. 17 32 19.4	5.087
1	20 36 54.58	2.1808	17 27 11.6	5.172
2	20 39 5.32	2.1772	17 21 58.7	5.257
3	20 41 15.84	2.1735	17 16 40.7	5.342
4	20 43 26.14	2.1698	17 11 17.7	5.425
5	20 45 36.22	2.1662	17 5 49.7	5.508
6	20 47 46.09	2.1626	17 0 16.7	5.591
7	20 49 55.74	2.1589	16 54 38.8	5.672
8	20 52 5.16	2.1551	16 48 56.1	5.752
9	20 54 14.35	2.1514	16 43 8.6	5.831
10	20 56 23.32	2.1477	16 37 16.4	5.909
11	20 58 32.07	2.1440	16 31 19.5	5.988
12	21 0 40.60	2.1402	16 25 17.9	6.066
13	21 2 48.90	2.1365	16 19 11.6	6.142
14	21 4 56.98	2.1327	16 13 0.8	6.217
15	21 7 4.83	2.1290	16 6 45.5	6.292
16	21 9 12.46	2.1252	16 0 25.7	6.367
17	21 11 19.86	2.1214	15 54 1.5	6.440
18	21 13 27.03	2.1177	15 47 32.9	6.512
19	21 15 33.98	2.1139	15 41 0.0	6.584
20	21 17 40.70	2.1102	15 34 22.8	6.656
21	21 19 47.20	2.1064	15 27 41.3	6.727
22	21 21 53.47	2.1027	15 20 55.6	6.796
23	21 23 59.52	2.0989	S. 15 14 5.8	6.864

THURSDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	21 26 5.34	2.0951	S. 15 7 12.0	6.931
1	21 28 10.93	2.0914	15 0 14.1	6.998
2	21 30 16.30	2.0877	14 53 12.2	7.065
3	21 32 21.45	2.0840	14 46 6.3	7.131
4	21 34 26.38	2.0803	14 38 56.5	7.195
5	21 36 31.08	2.0765	14 31 42.9	7.259
6	21 38 35.56	2.0728	14 24 25.4	7.322
7	21 40 39.82	2.0691	14 17 4.2	7.384
8	21 42 43.86	2.0654	14 9 39.3	7.446
9	21 44 47.67	2.0617	14 2 10.7	7.507
10	21 46 51.26	2.0581	13 54 38.5	7.567
11	21 48 54.64	2.0545	13 47 2.7	7.626
12	21 50 57.80	2.0508	13 39 23.4	7.684
13	21 53 0.74	2.0472	13 31 40.6	7.741
14	21 55 3.47	2.0437	13 23 54.4	7.797
15	21 57 5.98	2.0401	13 16 4.9	7.853
16	21 59 8.28	2.0365	13 8 12.0	7.909
17	22 1 10.36	2.0329	13 0 15.8	7.963
18	22 3 12.23	2.0294	12 52 16.4	8.016
19	22 5 13.89	2.0259	12 44 13.8	8.069
20	22 7 15.34	2.0224	12 36 8.1	8.122
21	22 9 16.58	2.0190	12 27 59.2	8.173
22	22 11 17.62	2.0156	12 19 47.3	8.223
23	22 13 18.45	2.0122	12 11 32.4	8.273
24	22 15 19.08	2.0088	S. 12 3 14.5	8.322

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 5.					**SUNDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 15 19.08	2.0088	S. 12 3 14.5	8.322	0	23 48 25.14	1.8845	S. 4 41 29.4	9.816
1	22 17 19.51	2.0054	11 54 53.7	8.370	1	23 50 18.16	1.8829	4 31 40.0	9.831
2	22 19 19.73	2.0020	11 46 30.1	8.418	2	23 52 11.09	1.8814	4 21 49.7	9.845
3	22 21 19.75	1.9987	11 38 3.6	8.465	3	23 54 3.93	1.8799	4 11 58.6	9.858
4	22 23 19.58	1.9955	11 29 34.3	8.510	4	23 55 56.68	1.8784	4 2 6.7	9.871
5	22 25 19.21	1.9922	11 21 2.4	8.554	5	23 57 49.34	1.8769	3 52 14.0	9.884
6	22 27 18.64	1.9889	11 12 27.8	8.598	6	23 59 41.91	1.8755	3 42 20.6	9.896
7	22 29 17.88	1.9857	11 3 50.6	8.642	7	0 1 34.40	1.8742	3 32 26.5	9.907
8	22 31 16.93	1.9826	10 55 10.7	8.686	8	0 3 26.81	1.8729	3 22 31.8	9.917
9	22 33 15.79	1.9794	10 46 28.3	8.727	9	0 5 19.15	1.8716	3 12 36.5	9.926
10	22 35 14.46	1.9763	10 37 43.4	8.768	10	0 7 11.41	1.8704	3 2 40.7	9.935
11	22 37 12.94	1.9732	10 28 56.1	8.809	11	0 9 3.60	1.8693	2 52 44.3	9.944
12	22 39 11.24	1.9701	10 20 6.3	8.849	12	0 10 55.73	1.8682	2 42 47.4	9.952
13	22 41 9.35	1.9671	10 11 14 2	8.888	13	0 12 47.79	1.8672	2 32 50.1	9.959
14	22 43 7.29	1.9642	10 2 19.8	8.927	14	0 14 39.79	1.8661	2 22 52.3	9.966
15	22 45 5.05	1.9612	9 53 23.0	8.965	15	0 16 31.72	1.8651	2 12 54.1	9.972
16	22 47 2.64	1.9583	9 44 24.0	9.001	16	0 18 23.60	1.8642	2 2 55.6	9.978
17	22 49 0.05	1.9553	9 35 22.9	9.037	17	0 20 15.43	1.8634	1 52 56.7	9.984
18	22 50 57.28	1.9524	9 26 19.6	9.073	18	0 22 7.21	1.8626	1 42 57.5	9.988
19	22 52 54.34	1.9496	9 17 14.2	9.108	19	0 23 58.94	1.8618	1 32 58.1	9.992
20	22 54 51.24	1.9469	9 8 6.7	9.141	20	0 25 50.63	1.8611	1 22 58.5	9.996
21	22 56 47.97	1.9442	8 58 57.2	9.174	21	0 27 42.27	1.8604	1 12 58.6	9.999
22	22 58 44.54	1.9414	8 49 45.8	9.207	22	0 29 33.87	1.8598	1 2 58.6	10.001
23	23 0 40.94	1.9387	S. 8 40 32.4	9.239	23	0 31 25.44	1.8592	S. 0 52 58.5	10.002
	SATURDAY 6.					**MONDAY 8.**			
0	23 2 37.18	1.9361	S. 8 31 17.1	9.270	0	0 33 16.97	1.8586	S. 0 42 58.4	10.003
1	23 4 33.27	1.9335	8 22 0.0	9.300	1	0 35 8.47	1.8581	0 32 58.2	10.003
2	23 6 29.20	1.9308	8 12 41.1	9.330	2	0 36 59.95	1.8577	0 22 58.0	10.004
3	23 8 24.97	1.9282	8 3 20.4	9.359	3	0 38 51.40	1.8573	0 12 57.7	10.004
4	23 10 20.59	1.9258	7 53 58.0	9.388	4	0 40 42.83	1.8570	S. 0 2 57.5	10.002
5	23 12 16.07	1.9234	7 44 33.9	9.416	5	0 42 34.24	1.8567	N. 0 7 2.6	10.000
6	23 14 11.40	1.9210	7 35 8.1	9.443	6	0 44 26.64	1.8565	0 17 2.5	9.998
7	23 16 6.59	1.9187	7 25 40.7	9.469	7	0 46 17.02	1.8563	0 27 2.3	9.995
8	23 18 1.64	1.9163	7 16 11.8	9.494	8	0 48 8.40	1.8562	0 37 1.9	9.992
9	23 19 56.55	1.9140	7 6 41.4	9.519	9	0 49 59.77	1.8561	0 47 1.3	9.988
10	23 21 51.32	1.9117	6 57 9.5	9.543	10	0 51 51.13	1.8560	0 57 0.4	9.983
11	23 23 45.95	1.9094	6 47 36.2	9.567	11	0 53 42.49	1.8561	1 6 59.2	9.978
12	23 25 40.45	1.9073	6 38 1.4	9.591	12	0 55 33.86	1.8562	1 16 57.8	9.973
13	23 27 34.83	1.9052	6 28 25.3	9.613	13	0 57 25.23	1.8563	1 26 56.0	9.967
14	23 29 29.08	1.9031	6 18 47.9	9.634	14	0 59 16.61	1.8564	1 36 53.8	9.960
15	23 31 23.20	1.9010	6 9 9.2	9.656	15	1 1 8.00	1.8566	1 46 51.2	9.953
16	23 33 17.20	1.8990	5 59 29.2	9.677	16	1 2 59.41	1.8569	1 56 48.2	9.945
17	23 35 11.08	1.8971	5 49 48.0	9.696	17	1 4 50.83	1.8572	2 6 44.6	9.936
18	23 37 4.85	1.8952	5 40 5.7	9.715	18	1 6 42.27	1.8576	2 16 40.5	9.927
19	23 38 58.50	1.8933	5 30 22.2	9.733	19	1 8 33 74	1.8580	2 26 35.8	9.918
20	23 40 52.04	1.8914	5 20 37.7	9.751	20	1 10 25.23	1.8584	2 36 30.6	9.908
21	23 42 45.47	1.8896	5 10 52.1	9.768	21	1 12 16.75	1.8590	2 46 24.8	9.897
22	23 44 38.80	1.8879	5 1 5.5	9.785	22	1 14 8.31	1.8596	2 56 18.3	9.886
23	23 46 32.02	1.8862	4 51 17.9	9.801	23	1 15 59.90	1.8602	3 6 11.1	9.875
24	23 48 25.14	1.8845	S. 4 41 29.4	9.816	24	1 17 51.53	1.8609	N. 3 16 3.3	9.863

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 17 51.53	1.8609	N. 3 16 3.3	9.863
1	1 19 43.20	1.8616	3 25 54.7	9.850
2	1 21 34.92	1.8623	3 35 45.3	9.837
3	1 23 26.68	1.8631	3 45 35.1	9.823
4	1 25 18.49	1.8640	3 55 24.0	9.808
5	1 27 10.36	1.8649	4 5 12.0	9.793
6	1 29 2.28	1.8658	4 14 59.2	9.778
7	1 30 54.26	1.8669	4 24 45.4	9.762
8	1 32 46.31	1.8680	4 34 30.6	9.746
9	1 34 38.42	1.8691	4 44 14.9	9.729
10	1 36 30.60	1.8702	4 53 58.1	9.711
11	1 38 22.85	1.8714	5 3 40.2	9.692
12	1 40 15.17	1.8727	5 13 21.1	9.672
13	1 42 7.57	1.8740	5 23 0.9	9.653
14	1 44 0.05	1.8754	5 32 39.5	9.634
15	1 45 52.62	1.8768	5 42 17.0	9.614
16	1 47 45.27	1.8783	5 51 53.2	9.593
17	1 49 38.02	1.8799	6 1 28.1	9.571
18	1 51 30.86	1.8814	6 11 1.7	9.549
19	1 53 23.79	1.8830	6 20 34.0	9.527
20	1 55 16.82	1.8847	6 30 4.9	9.503
21	1 57 9.96	1.8865	6 39 34.3	9.478
22	1 59 3.20	1.8882	6 49 2.3	9.454
23	2 0 56.55	1.8900	N. 6 58 28.8	9.429

WEDNESDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	2 2 50.00	1.8918	N. 7 7 53.8	9.404
1	2 4 43.56	1.8938	7 17 17.3	9.378
2	2 6 37.25	1.8958	7 26 39.2	9.351
3	2 8 31.06	1.8978	7 35 59.4	9.323
4	2 10 24.99	1.8999	7 45 18.0	9.296
5	2 12 19.05	1.9020	7 54 34.9	9.267
6	2 14 13.23	1.9041	8 3 50.0	9.238
7	2 16 7.54	1.9063	8 13 3.4	9.208
8	2 18 1.99	1.9087	8 22 15.0	9.177
9	2 19 56.58	1.9110	8 31 24.7	9.146
10	2 21 51.31	1.9133	8 40 32.5	9.115
11	2 23 46.18	1.9157	8 49 38.5	9.084
12	2 25 41.19	1.9181	8 58 42.6	9.052
13	2 27 36.35	1.9207	9 7 44.7	9.018
14	2 29 31.67	1.9233	9 16 44.7	8.983
15	2 31 27.14	1.9258	9 25 42.7	8.949
16	2 33 22.76	1.9284	9 34 38.6	8.914
17	2 35 18.55	1.9311	9 43 32.4	8.878
18	2 37 14.50	1.9339	9 52 24.0	8.842
19	2 39 10.62	1.9366	10 1 13.4	8.805
20	2 41 6.90	1.9394	10 10 0.6	8.767
21	2 43 3.35	1.9423	10 18 45.5	8.729
22	2 44 59.98	1.9452	10 27 28.1	8.691
23	2 46 56.78	1.9482	10 36 8.4	8.652
24	2 48 53.76	1.9512	N.10 44 46.3	8.612

THURSDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 48 53.76	1.9512	N.10 44 46.3	8.612
1	2 50 50.93	1.9543	10 53 21.8	8.571
2	2 52 48.28	1.9573	11 1 54.8	8.529
3	2 54 45.81	1.9604	11 10 25.3	8.486
4	2 56 43.53	1.9636	11 18 53.2	8.443
5	2 58 41.45	1.9669	11 27 18.5	8.400
6	3 0 39.56	1.9702	11 35 41.2	8.357
7	3 2 37.87	1.9735	11 44 1.3	8.312
8	3 4 36.38	1.9768	11 52 18.6	8.266
9	3 6 35.09	1.9802	12 0 33.2	8.220
10	3 8 34.01	1.9837	12 8 45.0	8.173
11	3 10 33.14	1.9871	12 16 54.0	8.126
12	3 12 32.47	1.9906	12 25 0.1	8.078
13	3 14 32.01	1.9942	12 33 3.3	8.029
14	3 16 31.77	1.9978	12 41 3.6	7.980
15	3 18 31.75	2.0015	12 49 0.9	7.930
16	3 20 31.95	2.0051	12 56 55.2	7.878
17	3 22 32.37	2.0088	13 4 46.3	7.826
18	3 24 33.01	2.0126	13 12 34.3	7.774
19	3 26 33.88	2.0164	13 20 19.2	7.721
20	3 28 34.98	2.0202	13 28 0.8	7.667
21	3 30 36.30	2.0240	13 35 39.2	7.612
22	3 32 37.86	2.0279	13 43 14.3	7.557
23	3 34 39.65	2.0318	N.13 50 46.1	7.502

FRIDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	3 36 41.67	2.0357	N.13 58 14.6	7.446
1	3 38 43.93	2.0397	14 5 39.6	7.388
2	3 40 46.44	2.0438	14 13 1.1	7.329
3	3 42 49.19	2.0478	14 20 19.1	7.271
4	3 44 52.18	2.0519	14 27 33.6	7.212
5	3 46 55.42	2.0561	14 34 44.5	7.151
6	3 48 58.91	2.0602	14 41 51.7	7.089
7	3 51 2.65	2.0644	14 48 55.2	7.027
8	3 53 6.64	2.0686	14 55 55.0	6.965
9	3 55 10.88	2.0728	15 2 51.0	6.901
10	3 57 15.38	2.0771	15 9 43.1	6.837
11	3 59 20.13	2.0814	15 16 31.4	6.772
12	4 1 25.14	2.0857	15 23 15.8	6.707
13	4 3 30.41	2.0900	15 29 56.2	6.640
14	4 5 35.94	2.0944	15 36 32.6	6.572
15	4 7 41.74	2.0988	15 43 4.9	6.504
16	4 9 47.80	2.1032	15 49 33.1	6.436
17	4 11 54.12	2.1075	15 55 57.2	6.367
18	4 14 0.70	2.1119	16 2 17.1	6.296
19	4 16 7.55	2.1164	16 8 32.7	6.224
20	4 18 14.67	2.1210	16 14 44.0	6.152
21	4 20 22.07	2.1255	16 20 50.9	6.079
22	4 22 29.73	2.1299	16 26 53.5	6.006
23	4 24 37.66	2.1345	16 32 51.6	5.931
24	4 26 45.87	2.1391	N.16 38 45.2	5.855

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 26 45.87	2.1391	N.16 38 45.2	5.855
1	4 28 54.35	2.1436	16 44 34.2	5.779
2	4 31 3.10	2.1482	16 50 18.7	5.703
3	4 33 12.13	2.1527	16 55 58.6	5.626
4	4 35 21.43	2.1573	17 1 33.8	5.547
5	4 37 31.01	2.1620	17 7 4.2	5.467
6	4 39 40.87	2.1666	17 12 29.8	5.387
7	4 41 51.01	2.1712	17 17 50.6	5.306
8	4 44 1.42	2.1758	17 23 6.5	5.224
9	4 46 12.11	2.1805	17 28 17.5	5.142
10	4 48 23.08	2.1851	17 33 23.5	5.058
11	4 50 34.32	2.1898	17 38 24.5	4.974
12	4 52 45.85	2.1945	17 43 20.4	4.888
13	4 54 57.66	2.1991	17 48 11.1	4.802
14	4 57 9.74	2.2037	17 52 56.7	4.716
15	4 59 22.10	2.2083	17 57 37.1	4.629
16	5 1 34.74	2.2130	18 2 12.2	4.541
17	5 3 47.66	2.2176	18 6 42.0	4.452
18	5 6 0.85	2.2222	18 11 6.4	4.362
19	5 8 14.32	2.2268	18 15 25.4	4.271
20	5 10 28.07	2.2314	18 19 38.9	4.179
21	5 12 42.09	2.2360	18 23 46.8	4.086
22	5 14 56.39	2.2407	18 27 49.2	3.993
23	5 17 10.97	2.2452	N.18 31 46.0	3.899

SUNDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	5 19 25.82	2.2497	N.18 35 37.1	3.804
1	5 21 40.94	2.2543	18 39 22.5	3.708
2	5 23 56.34	2.2589	18 43 2.1	3.612
3	5 26 12.01	2.2634	18 46 36.0	3.516
4	5 28 27.95	2.2679	18 50 4.0	3.417
5	5 30 44.16	2.2723	18 53 26.0	3.318
6	5 33 0.63	2.2768	18 56 42.1	3.218
7	5 35 17.37	2.2813	18 59 52.2	3.117
8	5 37 34.38	2.2857	19 2 56.2	3.016
9	5 39 51.65	2.2900	19 5 54.1	2.914
10	5 42 9.18	2.2943	19 8 45.9	2.812
11	5 44 26.97	2.2987	19 11 31.6	2.710
12	5 46 45.03	2.3031	19 14 11.1	2.606
13	5 49 3.34	2.3074	19 16 44.3	2.500
14	5 51 21.91	2.3116	19 19 11.1	2.394
15	5 53 40.73	2.3157	19 21 31.6	2.288
16	5 55 59.80	2.3199	19 23 45.7	2.181
17	5 58 19.12	2.3241	19 25 53.3	2.073
18	6 0 38.69	2.3282	19 27 54.4	1.964
19	6 2 58.50	2.3323	19 29 49.0	1.855
20	6 5 18.56	2.3363	19 31 37.0	1.746
21	6 7 38.86	2.3402	19 33 18.5	1.636
22	6 9 59.39	2.3442	19 34 53.3	1.524
23	6 12 20.16	2.3481	19 36 21.4	1.412
24	6 14 41.16	2.3519	N.19 37 42.7	1.299

MONDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 14 41.16	2.3519	N.19 37 42.7	1.299
1	6 17 2.39	2.3557	19 38 57.3	1.186
2	6 19 23.85	2.3595	19 40 5.1	1.072
3	6 21 45.53	2.3632	19 41 6.0	0.958
4	6 24 7.44	2.3669	19 42 0.1	0.844
5	6 26 29.56	2.3705	19 42 47.3	0.728
6	6 28 51.90	2.3741	19 43 27.5	0.612
7	6 31 14.45	2.3776	19 44 0.7	0.495
8	6 33 37.21	2.3811	19 44 26.9	0.378
9	6 36 0.18	2.3845	19 44 46.1	0.261
10	6 38 23.35	2.3878	19 44 58.2	0.142
11	6 40 46.72	2.3911	19 45 3.1	+0.022
12	6 43 10.28	2.3943	19 45 0.9	−0.097
13	6 45 34.04	2.3975	19 44 51.5	0.217
14	6 47 57.98	2.4006	19 44 34.9	0.336
15	6 50 22.11	2.4037	19 44 11.2	0.456
16	6 52 46.42	2.4067	19 43 40.2	0.577
17	6 55 10.91	2.4096	19 43 1.9	0.699
18	6 57 35.57	2.4124	19 42 16.3	0.821
19	7 0 0.40	2.4152	19 41 23.4	0.943
20	7 2 25.40	2.4180	19 40 23.1	1.066
21	7 4 50.56	2.4207	19 39 15.5	1.189
22	7 7 15.88	2.4233	19 38 0.5	1.312
23	7 9 41.35	2.4258	N.19 36 38.1	1.436

TUESDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 12 6.97	2.4283	N.19 35 8.2	1.560
1	7 14 32.74	2.4307	19 33 30.9	1.684
2	7 16 58.65	2.4330	19 31 46.1	1.808
3	7 19 24.70	2.4352	19 29 53.9	1.932
4	7 21 50.88	2.4374	19 27 54.2	2.057
5	7 24 17.19	2.4396	19 25 47.0	2.182
6	7 26 43.63	2.4417	19 23 32.4	2.307
7	7 29 10.19	2.4436	19 21 10.2	2.432
8	7 31 36.86	2.4454	19 18 40.5	2.557
9	7 34 3.64	2.4473	19 16 3.3	2.683
10	7 36 30.53	2.4491	19 13 18.5	2.809
11	7 38 57.53	2.4508	19 10 26.2	2.935
12	7 41 24.63	2.4524	19 7 26.3	3.061
13	7 43 51.82	2.4539	19 4 18.9	3.187
14	7 46 19.10	2.4554	19 1 3.9	3.312
15	7 48 46.47	2.4568	18 57 41.4	3.437
16	7 51 13.92	2.4581	18 54 11.4	3.563
17	7 53 41.44	2.4594	18 50 33.8	3.689
18	7 56 9.04	2.4606	18 46 48.7	3.814
19	7 58 36.71	2.4617	18 42 56.1	3.940
20	8 1 4.44	2.4627	18 38 55.9	4.066
21	8 3 32.23	2.4636	18 34 48.2	4.191
22	8 6 0.07	2.4645	18 30 33.0	4.316
23	8 8 27.97	2.4653	18 26 10.3	4.440
24	8 10 55.91	2.4661	N.18 21 40.2	4.564

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 17.					FRIDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 10 55.91	2.4661	N.18 21 40.2	4.564	0	10 8 56.79	2.4311	N.12 28 58.6	9.829
1	8 13 23.90	2.4667	18 17 2.6	4.689	1	10 11 22.60	2.4293	12 19 6.3	9.915
2	8 15 51.92	2.4673	18 12 17.5	4.813	2	10 13 48.31	2.4276	12 9 8.8	10.001
3	8 18 19.98	2.4679	18 7 25.0	4.937	3	10 16 13.91	2.4258	11 59 6.2	10.085
4	8 20 48.07	2.4683	18 2 25.1	5.060	4	10 18 39.40	2.4239	11 48 58.6	10.167
5	8 23 16.18	2.4687	17 57 17.8	5.183	5	10 21 4.78	2.4221	11 38 46.1	10.248
6	8 25 44.31	2.4690	17 52 3.1	5.306	6	10 23 30.05	2.4202	11 28 28.8	10.328
7	8 28 12.46	2.4693	17 46 41.1	5.428	7	10 25 55.20	2.4183	11 18 6.7	10.407
8	8 30 40.62	2.4695	17 41 11.8	5.549	8	10 28 20.24	2.4164	11 7 39.9	10.485
9	8 33 8.80	2.4697	17 35 35.2	5.671	9	10 30 45.17	2.4145	10 57 8.5	10.561
10	8 35 36.98	2.4697	17 29 51.3	5.792	10	10 33 9.98	2.4126	10 46 32.6	10.636
11	8 38 5.16	2.4696	17 24 0.2	5.912	11	10 35 34.68	2.4107	10 35 52.2	10.709
12	8 40 33.33	2.4695	17 18 1.9	6.032	12	10 37 59.26	2.4087	10 25 7.5	10.780
13	8 43 1.50	2.4694	17 11 56.4	6.152	13	10 40 23.72	2.4067	10 14 18.6	10.851
14	8 45 29.66	2.4691	17 5 43.7	6.271	14	10 42 48.07	2.4047	10 3 25.4	10.922
15	8 47 57.80	2.4688	16 59 23.9	6.389	15	10 45 12.30	2.4028	9 52 28.0	10.990
16	8 50 25.92	2.4685	16 52 57.0	6.507	16	10 47 36.41	2.4008	9 41 26.6	11.056
17	8 52 54.02	2.4682	16 46 23.1	6.624	17	10 50 0.40	2.3989	9 30 21.3	11.120
18	8 55 22.10	2.4677	16 39 42.2	6.740	18	10 52 24.28	2.3970	9 19 12.2	11.183
19	8 57 50.14	2.4671	16 32 54.3	6.856	19	10 54 48.04	2.3949	9 7 59.3	11.246
20	9 0 18.15	2.4666	16 25 59.5	6.970	20	10 57 11.67	2.3929	8 56 42.7	11.307
21	9 2 46.13	2.4660	16 18 57.9	7.084	21	10 59 35.19	2.3910	8 45 22.5	11.366
22	9 5 14.07	2.4653	16 11 49.4	7.198	22	11 1 58.59	2.3890	8 33 58.8	11.424
23	9 7 41.96	2.4645	N.16 4 34.1	7.312	23	11 4 21.87	2.3871	N. 8 22 31.6	11.481
	THURSDAY 18.					SATURDAY 20.			
0	9 10 9.81	2.4637	N.15 57 12.0	7.424	0	11 6 45.04	2.3852	N. 8 11 1.1	11.536
1	9 12 37.61	2.4628	15 49 43.2	7.535	1	11 9 8.09	2.3832	7 59 27.3	11.589
2	9 15 5.35	2.4619	15 42 7.8	7.645	2	11 11 31.02	2.3812	7 47 50.4	11.640
3	9 17 33.04	2.4610	15 34 25.8	7.755	3	11 13 53.84	2.3793	7 36 10.5	11.690
4	9 20 0.67	2.4600	15 26 37.2	7.863	4	11 16 16.54	2.3773	7 24 27.6	11.740
5	9 22 28.24	2.4589	15 18 42.2	7.971	5	11 18 39.12	2.3754	7 12 41.7	11.788
6	9 24 55.74	2.4578	15 10 40.7	8.078	6	11 21 1.59	2.3736	7 0 53.0	11.834
7	9 27 23.18	2.4566	15 2 32.8	8.185	7	11 23 23.95	2.3717	6 49 1.6	11.878
8	9 29 50.54	2.4554	14 54 18.5	8.290	8	11 25 46.19	2.3698	6 37 7.6	11.922
9	9 32 17.83	2.4542	14 45 58.0	8.394	9	11 28 8.32	2.3679	6 25 11.0	11.963
10	9 34 45.04	2.4529	14 37 31.3	8.497	10	11 30 30.34	2.3661	6 13 12.0	12.003
11	9 37 12.17	2.4516	14 28 58.4	8.600	11	11 32 52.25	2.3642	6 1 10.6	12.042
12	9 39 39.23	2.4502	14 20 19.3	8.702	12	11 35 14.04	2.3624	5 49 7.0	12.078
13	9 42 6.20	2.4487	14 11 34.2	8.801	13	11 37 35.73	2.3606	5 37 1.2	12.114
14	9 44 33.08	2.4473	14 2 43.2	8.899	14	11 39 57.31	2.3588	5 24 53.3	12.148
15	9 46 59.88	2.4459	13 53 46.3	8.997	15	11 42 18.79	2.3571	5 12 43.4	12.181
16	9 49 26.59	2.4444	13 44 43.5	9.095	16	11 44 40.16	2.3553	5 0 31.6	12.212
17	9 51 53.21	2.4428	13 35 34.9	9.191	17	11 47 1.43	2.3536	4 48 18.0	12.242
18	9 54 19.73	2.4413	13 26 20.6	9.286	18	11 49 22.59	2.3518	4 36 2.6	12.270
19	9 56 46.16	2.4397	13 17 0.6	9.379	19	11 51 43.65	2.3501	4 23 45.6	12.296
20	9 59 12.49	2.4380	13 7 35.1	9.471	20	11 54 4.61	2.3485	4 11 27.1	12.321
21	10 1 38.72	2.4363	12 58 4.1	9.562	21	11 56 25.47	2.3469	3 59 7.1	12.344
22	10 4 4.85	2.4346	12 48 27.6	9.653	22	11 58 46.24	2.3453	3 46 45.8	12.366
23	10 6 30.87	2.4328	12 38 45.7	9.742	23	12 1 6.91	2.3437	3 34 23.2	12.387
24	10 8 56.79	2.4311	N.12 28 58.6	9.829	24	12 3 27.49	2.3422	N. 3 21 59.4	12.406

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 3 27.49	2.3422	N. 3 21 59.4	12.406
1	12 5 47.98	2.3407	3 9 34.5	12.423
2	12 8 8.37	2.3391	2 57 8.6	12.439
3	12 10 28.67	2.3376	2 44 41.8	12.453
4	12 12 48.88	2.3362	2 32 14.2	12.466
5	12 15 9.01	2.3347	2 19 45.9	12.477
6	12 17 29.05	2.3333	2 7 16.9	12.488
7	12 19 49.01	2.3320	1 54 47.3	12.497
8	12 22 8.89	2.3306	1 42 17.3	12.503
9	12 24 28.68	2.3293	1 29 46.9	12.509
10	12 26 48.40	2.3280	1 17 16.2	12.512
11	12 29 8.04	2.3268	1 4 45.4	12.515
12	12 31 27.61	2.3256	0 52 14.4	12.517
13	12 33 47.11	2.3244	0 39 43.4	12.516
14	12 36 6.54	2.3232	0 27 12.5	12.514
15	12 38 25.90	2.3221	0 14 41.7	12.511
16	12 40 45.19	2.3209	N. 0 2 11.2	12.506
17	12 43 4.41	2.3198	S. 0 10 19.0	12.500
18	12 45 23.57	2.3188	0 22 48.8	12.492
19	12 47 42.67	2.3178	0 35 18.1	12.483
20	12 50 1.71	2.3169	0 47 46.8	12.472
21	12 52 20.70	2.3160	1 0 14.8	12.461
22	12 54 39.63	2.3151	1 12 42.1	12.448
23	12 56 58.51	2.3142	S. 1 25 8.6	12.433

MONDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 59 17.34	2.3134	S. 1 37 34.1	12.417
1	13 1 36.12	2.3126	1 49 58.6	12.399
2	13 3 54.85	2.3118	2 2 22.0	12.381
3	13 6 13.54	2.3111	2 14 44.3	12.361
4	13 8 32.18	2.3104	2 27 5.3	12.338
5	13 10 50.78	2.3097	2 39 24.9	12.315
6	13 13 9.34	2.3090	2 51 43.1	12.291
7	13 15 27.86	2.3084	3 3 59.8	12.265
8	13 17 46.35	2.3079	3 16 14.9	12.237
9	13 20 4.81	2.3073	3 28 28.3	12.209
10	13 22 23.23	2.3068	3 40 40.0	12.180
11	13 24 41.62	2.3063	3 52 49.9	12.149
12	13 26 59.99	2.3059	4 4 57.9	12.117
13	13 29 18.33	2.3055	4 17 3.9	12.083
14	13 31 36.65	2.3051	4 29 7.9	12.048
15	13 33 54.94	2.3047	4 41 9.7	12.012
16	13 36 13.21	2.3044	4 53 9.3	11.974
17	13 38 31.47	2.3042	5 5 6.6	11.936
18	13 40 49.72	2.3040	5 17 1.6	11.896
19	13 43 7.95	2.3037	5 28 54.1	11.854
20	13 45 26.17	2.3035	5 40 44.1	11.812
21	13 47 44.37	2.3033	5 52 31.6	11.769
22	13 50 2.56	2.3032	6 4 16.4	11.723
23	13 52 20.75	2.3031	6 15 58.4	11.677
24	13 54 38.93	2.3030	S. 6 27 37.6	11.629

TUESDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 54 38.93	2.3030	S. 6 27 37.6	11.629
1	13 56 57.11	2.3030	6 39 13.9	11.581
2	13 59 15.29	2.3029	6 50 47.3	11.532
3	14 1 33.46	2.3029	7 2 17.7	11.481
4	14 3 51.64	2.3030	7 13 45.0	11.428
5	14 6 9.82	2.3031	7 25 9.1	11.375
6	14 8 28.01	2.3032	7 36 30.0	11.321
7	14 10 46.20	2.3033	7 47 47.6	11.265
8	14 13 4.40	2.3034	7 59 1.8	11.208
9	14 15 22.61	2.3036	8 10 12.6	11.151
10	14 17 40.83	2.3038	8 21 19.9	11.092
11	14 19 59.06	2.3040	8 32 23.6	11.032
12	14 22 17.31	2.3042	8 43 23.7	10.971
13	14 24 35.57	2.3045	8 54 20.1	10.908
14	14 26 53.85	2.3048	9 5 12.7	10.845
15	14 29 12.15	2.3051	9 16 1.5	10.781
16	14 31 30.46	2.3054	9 26 46.4	10.716
17	14 33 48.79	2.3058	9 37 27.4	10.650
18	14 36 7.15	2.3062	9 48 4.4	10.582
19	14 38 25.53	2.3065	9 58 37.3	10.514
20	14 40 43.93	2.3068	10 9 6.1	10.444
21	14 43 2.35	2.3072	10 19 30.6	10.373
22	14 45 20.80	2.3077	10 29 50.9	10.302
23	14 47 39.28	2.3082	S. 10 40 6.9	10.230

WEDNESDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 49 57.79	2.3087	S. 10 50 18.5	10.157
1	14 52 16.33	2.3092	11 0 25.7	10.083
2	14 54 34.90	2.3096	11 10 28.4	10.008
3	14 56 53.49	2.3101	11 20 26.6	9.932
4	14 59 12.11	2.3107	11 30 20.2	9.854
5	15 1 30.77	2.3112	11 40 9.1	9.776
6	15 3 49.46	2.3117	11 49 53.3	9.697
7	15 6 8.18	2.3123	11 59 32.7	9.617
8	15 8 26.94	2.3129	12 9 7.4	9.537
9	15 10 45.73	2.3135	12 18 37.2	9.455
10	15 13 4.56	2.3141	12 28 2.0	9.373
11	15 15 23.42	2.3146	12 37 21.9	9.290
12	15 17 42.31	2.3152	12 46 36.8	9.206
13	15 20 1.24	2.3158	12 55 46.6	9.121
14	15 22 20.21	2.3164	13 4 51.3	9.035
15	15 24 39.21	2.3170	13 13 50.8	8.948
16	15 26 58.25	2.3176	13 22 45.1	8.861
17	15 29 17.33	2.3182	13 31 34.1	8.773
18	15 31 36.44	2.3188	13 40 17.9	8.685
19	15 33 55.59	2.3194	13 48 56.3	8.595
20	15 36 14.77	2.3200	13 57 29.3	8.504
21	15 38 33.99	2.3206	14 5 56.8	8.413
22	15 40 53.25	2.3212	14 14 18.8	8.322
23	15 43 12.54	2.3218	14 22 35.4	8.230
24	15 45 31.87	2.3224	S. 14 30 46.4	8.136

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 45 31.87	2.3224	S. 14 30 46.4	8.136
1	15 47 51.23	2.3230	14 38 51.7	8.042
2	15 50 10.63	2.3236	14 46 51.4	7.947
3	15 52 30.07	2.3242	14 54 45.4	7.852
4	15 54 49.54	2.3247	15 2 33.7	7.757
5	15 57 9.04	2.3253	15 10 16.2	7.660
6	15 59 28.58	2.3259	15 17 52.9	7.563
7	16 1 48.15	2.3264	15 25 23.8	7.466
8	16 4 7.75	2.3269	15 32 48.8	7.367
9	16 6 27.38	2.3274	15 40 7.8	7.267
10	16 8 47.04	2.3279	15 47 20.9	7.168
11	16 11 6.73	2.3284	15 54 28.0	7.068
12	16 13 26.45	2.3289	16 1 29.1	6.967
13	16 15 46.20	2.3293	16 8 24.1	6.866
14	16 18 5.97	2.3297	16 15 13.0	6.765
15	16 20 25.77	2.3302	16 21 55.9	6.663
16	16 22 45.59	2.3306	16 28 32.6	6.560
17	16 25 5.44	2.3311	16 35 3.1	6.457
18	16 27 25.32	2.3315	16 41 27.4	6.353
19	16 29 45.22	2.3318	16 47 45.4	6.248
20	16 32 5.13	2.3320	16 53 57.2	6.144
21	16 34 25.06	2.3323	17 0 2.7	6.039
22	16 36 45.01	2.3326	17 6 1.9	5.933
23	16 39 4.97	2.3328	S. 17 11 54.7	5.828

FRIDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	16 41 24.95	2.3331	S. 17 17 41.2	5.722
1	16 43 44.95	2.3333	17 23 21.3	5.614
2	16 46 4.95	2.3334	17 28 54.9	5.507
3	16 48 24.96	2.3336	17 34 22.1	5.399
4	16 50 44.98	2.3337	17 39 42.8	5.292
5	16 53 5.00	2.3338	17 44 57.1	5.184
6	16 55 25.03	2.3338	17 50 4.9	5.075
7	16 57 45.06	2.3338	17 55 6.1	4.966
8	17 0 5.09	2.3338	18 0 0.8	4.857
9	17 2 25.12	2.3337	18 4 49.0	4.748
10	17 4 45.14	2.3337	18 9 30.6	4.638
11	17 7 5.16	2.3337	18 14 5.6	4.527
12	17 9 25.18	2.3336	18 18 33.9	4.417
13	17 11 45.19	2.3334	18 22 55.6	4.307
14	17 14 5.18	2.3331	18 27 10.7	4.196
15	17 16 25.16	2.3328	18 31 19.1	4.085
16	17 18 45.12	2.3325	18 35 20.9	3.974
17	17 21 5.06	2.3322	18 39 16.0	3.863
18	17 23 24.99	2.3319	18 43 4.5	3.752
19	17 25 44.89	2.3315	18 46 46.3	3.640
20	17 28 4.77	2.3311	18 50 21.3	3.528
21	17 30 24.62	2.3306	18 53 49.6	3.416
22	17 32 44.44	2.3300	18 57 11.2	3.304
23	17 35 4.22	2.3294	19 0 26.1	3.192
24	17 37 23.97	2.3288	S. 19 3 34.2	3.079

SATURDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 37 23.97	2.3288	S. 19 3 34.2	3.079
1	17 39 43.68	2.3282	19 6 35.6	2.967
2	17 42 3.35	2.3275	19 9 30.2	2.854
3	17 44 22.98	2.3268	19 12 18.1	2.742
4	17 46 42.57	2.3261	19 14 59.2	2.629
5	17 49 2.12	2.3254	19 17 33.6	2.517
6	17 51 21.62	2.3245	19 20 1.3	2.405
7	17 53 41.06	2.3236	19 22 22.2	2.292
8	17 56 0.45	2.3227	19 24 36.3	2.179
9	17 58 19.78	2.3217	19 26 43.7	2.067
10	18 0 39.05	2.3207	19 28 44.3	1.954
11	18 2 58.26	2.3197	19 30 38.2	1.842
12	18 5 17.41	2.3186	19 32 25.4	1.730
13	18 7 36.49	2.3174	19 34 5.8	1.617
14	18 9 55.50	2.3162	19 35 39.5	1.505
15	18 12 14.43	2.3149	19 37 6.4	1.393
16	18 14 33.29	2.3136	19 38 26.6	1.281
17	18 16 52.07	2.3123	19 39 40.1	1.168
18	18 19 10.77	2.3110	19 40 46.8	1.056
19	18 21 29.39	2.3096	19 41 46.8	0.945
20	18 23 47.92	2.3081	19 42 40.2	0.834
21	18 26 6.36	2.3066	19 43 26.9	0.722
22	18 28 24.71	2.3050	19 44 6.9	0.611
23	18 30 42.96	2.3034	S. 19 44 40.2	0.499

SUNDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 33 1.12	2.3018	S. 19 45 6.8	0.388
1	18 35 19.18	2.3001	19 45 26.8	0.278
2	18 37 37.14	2.2984	19 45 40.2	0.168
3	18 39 54.99	2.2966	19 45 47.0	−0.058
4	18 42 12.73	2.2949	19 45 47.2	+0.052
5	18 44 30.37	2.2931	19 45 40.8	0.162
6	18 46 47.90	2.2912	19 45 27.8	0.271
7	18 49 5.31	2.2892	19 45 8.3	0.379
8	18 51 22.60	2.2872	19 44 42.3	0.488
9	18 53 39.78	2.2852	19 44 9.7	0.597
10	18 55 56.83	2.2832	19 43 30.6	0.705
11	18 58 13.76	2.2811	19 42 45.1	0.812
12	19 0 30.56	2.2789	19 41 53.1	0.920
13	19 2 47.23	2.2767	19 40 54.7	1.027
14	19 5 3.77	2.2745	19 39 49.9	1.133
15	19 7 20.17	2.2722	19 38 38.7	1.240
16	19 9 36.43	2.2699	19 37 21.1	1.347
17	19 11 52.56	2.2676	19 35 57.1	1.453
18	19 14 8.55	2.2652	19 34 26.8	1.558
19	19 16 24.39	2.2628	19 32 50.2	1.662
20	19 18 40.09	2.2604	19 31 7.4	1.766
21	19 20 55.64	2.2579	19 29 18.3	1.870
22	19 23 11.04	2.2553	19 27 23.0	1.973
23	19 25 26.28	2.2528	19 25 21.5	2.076
24	19 27 41.37	2.2502	S. 19 23 13.8	2.179

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	h m s	s	° ′ ″	″
0	19 27 41.37	2.2502	S. 19 23 13.8	2.179
1	19 29 56.30	2.2475	19 21 0.0	2.281
2	19 32 11.07	2.2449	19 18 40.1	2.382
3	19 34 25.69	2.2422	19 16 14.1	2.483
4	19 36 40.14	2.2394	19 13 42.1	2.584
5	19 38 54.42	2.2367	19 11 4.0	2.685
6	19 41 8.54	2.2339	19 8 19.9	2.784
7	19 43 22.49	2.2311	19 5 29.9	2.882
8	19 45 36.27	2.2282	19 2 34.0	2.981
9	19 47 49.87	2.2253	18 59 32.2	3.079
10	19 50 3.30	2.2224	18 56 24.5	3.177
11	19 52 16.56	2.2195	18 53 10.7	3.275
12	19 54 29.64	2.2165	18 49 51.5	3.371
13	19 56 42.54	2.2135	18 46 26.4	3.466
14	19 58 55.26	2.2104	18 42 55.6	3.561
15	20 1 7.79	2.2073	18 39 19.1	3.656
16	20 3 20.14	2.2043	18 35 36.9	3.750
17	20 5 32.31	2.2013	18 31 49.1	3.843
18	20 7 44.30	2.1982	18 27 55.7	3.936
19	20 9 56.10	2.1950	18 23 56.8	4.028
20	20 12 7.70	2.1918	18 19 52.4	4.120
21	20 14 19.12	2.1887	18 15 42.4	4.212
22	20 16 30.35	2.1855	18 11 27.0	4.302
23	20 18 41.38	2.1822	S. 18 7 6.2	4.391

TUESDAY 30

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
0	20 20 52.22	2.1790	S. 18 2 40.1	4.480
1	20 23 2.86	2.1757	17 58 8.6	4.568
2	20 25 13.31	2.1725	17 53 31.9	4.656
3	20 27 23.56	2.1692	17 48 49.9	4.743
4	20 29 33.61	2.1659	17 44 2.7	4.830
5	20 31 43.47	2.1626	17 39 10.3	4.916
6	20 33 53.13	2.1593	17 34 12.8	5.001
7	20 36 2.59	2.1560	17 29 10.2	5.085
8	20 38 11.85	2.1526	17 24 2.6	5.168
9	20 40 20.90	2.1492	17 18 50.0	5.252
10	20 42 29.75	2.1458	17 13 32.4	5.335
11	20 44 38.40	2.1425	17 8 9.8	5.417
12	20 46 46.85	2.1391	17 2 42.3	5.498
13	20 48 55.09	2.1357	16 57 10.0	5.578
14	20 51 3.13	2.1323	16 51 32.9	5.657
15	20 53 10.97	2.1289	16 45 51.1	5.736
16	20 55 18.60	2.1254	16 40 4.6	5.814
17	20 57 26.02	2.1220	16 34 13.4	5.892
18	20 59 33.24	2.1186	16 28 17.5	5.970
19	21 1 40.25	2.1152	16 22 17.0	6.046
20	21 3 47.06	2.1117	16 16 12.0	6.121
21	21 5 53.66	2.1083	16 10 2.5	6.196
22	21 8 0.06	2.1049	16 3 48.5	6.270
23	21 10 6.25	2.1015	15 57 30.1	6.343
24	21 12 12.24	2.0981	S. 15 51 7.4	6.415

WEDNESDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 12 12.24	2.0981	S. 15 51 7.4	6.415
1	21 14 18.02	2.0946	15 44 40.3	6.487
2	21 16 23.59	2.0912	15 38 8.9	6.558
3	21 18 28.96	2.0877	15 31 33.3	6.628
4	21 20 34.12	2.0843	15 24 53.5	6.698
5	21 22 39.08	2.0810	15 18 9.5	6.767
6	21 24 43.84	2.0776	15 11 21.4	6.836
7	21 26 48.39	2.0742	15 4 29.2	6.903
8	21 28 52.74	2.0707	14 57 33.0	6.969
9	21 30 56.88	2.0673	14 50 32.9	7.035
10	21 33 0.82	2.0639	14 43 28.8	7.100
11	21 35 4.55	2.0605	14 36 20.9	7.164
12	21 37 8.08	2.0572	14 29 9.1	7.228
13	21 39 11.41	2.0538	14 21 53.5	7.291
14	21 41 14.54	2.0505	14 14 34.2	7.353
15	21 43 17.47	2.0472	14 7 11.2	7.414
16	21 45 20.20	2.0439	13 59 44.5	7.476
17	21 47 22.74	2.0406	13 52 14.1	7.537
18	21 49 25.08	2.0373	13 44 40.1	7.596
19	21 51 27.22	2.0341	13 37 2.6	7.654
20	21 53 29.17	2.0308	13 29 21.7	7.711
21	21 55 30.92	2.0276	13 21 37.3	7.768
22	21 57 32.48	2.0243	13 13 49.5	7.824
23	21 59 33.84	2.0211	S. 13 5 58.4	7.879

THURSDAY, SEPTEMBER 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 1 35.01	2.0179	S. 12 58 4.0	7.934

PHASES OF THE MOON.

		d	h	m
○ Full Moon	. August	3	8	40.1
☾ Last Quarter	. . . .	11	11	36.4
● New Moon	. . . .	18	17	38.6
☽ First Quarter	. . .	25	8	21.0

		d	h
☾ Apogee	. . . August	8	12.8
☾ Perigee	. . . . . .	20	12.3

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Spica	W.	78° 46′ 33″	2668	80° 23′ 56″	2676	82° 1′ 8″	2685	83° 38′ 8″	2693
	Jupiter	W.	72 41 32	2683	74 18 35	2692	75 55 26	2701	77 32 5	2709
	Antares	W.	33 36 1	2832	35 9 47	2825	36 43 42	2821	38 17 43	2818
	Fomalhaut	E.	55 53 20	3043	54 24 1	3069	52 55 13	3096	51 26 59	3126
	α Pegasi	E.	71 1 37	3018	69 31 47	3035	68 2 18	3053	66 33 11	3073
2	Spica	W.	91 40 13	2738	93 16 2	2748	94 51 38	2757	96 27 2	2766
	Jupiter	W.	85 32 23	2755	87 7 50	2764	88 43 5	2774	90 18 7	2783
	Antares	W.	46 8 5	2822	47 42 4	2826	49 15 58	2831	50 49 46	2835
	Fomalhaut	E.	44 15 34	3310	42 51 34	3357	41 28 28	3408	40 6 21	3464
	α Pegasi	E.	59 13 49	3183	57 47 20	3210	56 21 23	3238	54 55 59	3267
	α Arietis	E.	101 38 5	2867	100 5 4	2874	98 32 12	2882	96 59 30	2890
3	Jupiter	W.	98 10 14	2831	99 44 2	2840	101 17 38	2849	102 51 2	2859
	Antares	W.	58 37 8	2863	60 10 14	2870	61 43 11	2877	63 15 59	2885
	α Pegasi	E.	47 58 23	3449	46 37 2	3495	45 16 32	3545	43 56 57	3598
	α Arietis	E.	89 18 43	2935	87 47 8	2944	86 15 45	2954	84 44 35	2964
4	Antares	W.	70 57 35	2923	72 29 25	2931	74 1 5	2939	75 32 35	2946
	α Arietis	E.	77 11 57	3018	75 42 6	3029	74 12 29	3041	72 43 7	3052
	Aldebaran	E.	109 1 47	2855	107 28 31	2865	105 55 27	2874	104 22 35	2883
5	Antares	W.	83 7 32	2987	84 38 1	2995	86 8 20	3003	87 38 29	3010
	α Aquilæ	W.	42 36 20	4245	43 44 4	4181	44 52 48	4124	46 2 27	4072
	α Arietis	E.	65 19 56	3114	63 52 4	3128	62 24 28	3142	60 57 9	3156
	Aldebaran	E.	96 41 2	2926	95 9 16	2934	93 37 40	2942	92 6 15	2950
6	α Aquilæ	W.	52 1 49	3881	53 15 28	3854	54 29 35	3828	55 44 8	3806
	α Arietis	E.	53 44 56	3232	52 19 25	3249	50 54 15	3267	49 29 25	3286
	Aldebaran	E.	84 31 38	2989	83 1 11	2995	81 30 52	3001	80 0 41	3008
7	α Aquilæ	W.	62 2 4	3720	63 18 30	3708	64 35 9	3695	65 52 1	3685
	α Arietis	E.	42 31 8	3397	41 8 48	3424	39 46 59	3454	38 25 43	3486
	Aldebaran	E.	72 31 43	3037	71 2 16	3043	69 32 56	3047	68 3 41	3051
8	α Aquilæ	W.	72 18 52	3643	73 36 40	3636	74 54 35	3631	76 12 36	3625
	Fomalhaut	W.	38 8 42	3821	39 23 22	3777	40 38 48	3737	41 54 56	3701
	Aldebaran	E.	60 38 37	3067	59 9 47	3069	57 41 0	3072	56 12 16	3073
	Mars	E.	100 36 45	3322	99 12 59	3325	97 49 16	3326	96 25 35	3328
	Sun	E.	128 6 24	3432	126 44 44	3435	125 23 7	3437	124 1 32	3438
9	Fomalhaut	W.	48 24 7	3562	49 43 23	3541	51 3 2	3520	52 23 4	3501
	α Pegasi	W.	36 0 26	4193	37 8 59	4118	38 18 43	4050	39 29 33	3988
	Aldebaran	E.	48 48 52	3074	47 20 11	3073	45 51 29	3072	44 22 45	3070
	Mars	E.	89 27 26	3329	88 3 48	3327	86 40 8	3325	85 16 26	3324
	Pollux	E.	92 57 42	3129	91 30 8	3128	90 2 32	3126	88 34 54	3124
	Sun	E.	117 13 55	3439	115 52 23	3438	114 30 50	3438	113 9 16	3436
10	Fomalhaut	W.	59 8 18	3417	60 30 15	3401	61 52 30	3386	63 15 2	3372
	α Pegasi	W.	45 37 32	3749	46 53 27	3711	48 10 2	3676	49 27 15	3643
	Aldebaran	E.	36 58 21	3054	35 29 15	3049	34 0 3	3044	32 30 45	3039
	Mars	E.	78 17 13	3307	76 53 10	3302	75 29 1	3296	74 4 45	3290

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Spica	W.	85° 14′ 57″	2702	86° 51′ 34″	2711	88° 27′ 59″	2720	90° 4′ 12″	2729
	Jupiter	W.	79 8 33	2718	80 44 49	2727	82 20 53	2737	83 56 44	2746
	Antares	W.	39 51 47	2817	41 25 53	2817	42 59 59	2818	44 34 3	2820
	Fomalhaut	E.	49 59 21	3158	48 32 21	3191	47 6 1	3227	45 40 24	3267
	α Pegasi	E.	65 4 28	3092	63 36 9	3113	62 8 15	3135	60 40 48	3158
2	Spica	W.	98 2 14	2775	99 37 14	2785	101 12 1	2795	102 46 36	2805
	Jupiter	W.	91 52 57	2792	93 27 35	2802	95 2 0	2811	96 36 13	2821
	Antares	W.	52 23 28	2840	53 57 4	2845	55 30 33	2852	57 3 54	2857
	Fomalhaut	E.	38 45 17	3596	37 25 22	3594	36 6 41	3670	34 49 22	3756
	α Pegasi	E.	53 31 9	3299	52 6 56	3333	50 43 23	3369	49 20 31	3408
	α Arietis	E.	95 26 58	2898	93 54 37	2906	92 22 28	2916	90 50 30	2925
3	Jupiter	W.	104 24 13	2869	105 57 12	2878	107 29 59	2888	109 2 33	2896
	Antares	W.	64 48 37	2892	66 21 6	2900	67 53 25	2907	69 25 35	2915
	α Pegasi	E.	42 38 20	3655	41 20 45	3718	40 4 17	3787	38 49 1	3863
	α Arietis	E.	83 13 37	2974	81 42 52	2985	80 12 20	2996	78 42 2	3006
4	Antares	W.	77 3 55	2954	78 35 5	2963	80 6 4	2971	81 36 53	2979
	α Arietis	E.	71 13 59	3064	69 45 5	3076	68 16 26	3089	66 48 3	3102
	Aldebaran	E.	102 49 54	2891	101 17 24	2901	99 45 6	2909	98 12 59	2917
5	Antares	W.	89 8 29	3018	90 38 19	3026	92 7 59	3034	93 37 29	3042
	α Aquilæ	W.	47 12 56	4025	48 24 11	3963	49 36 7	3945	50 48 41	3912
	α Arietis	E.	59 30 7	3170	58 3 22	3185	56 36 55	3200	55 10 46	3216
	Aldebaran	E.	90 35 0	2958	89 3 55	2966	87 33 0	2973	86 2 14	2981
6	α Aquilæ	W.	56 59 4	3786	58 14 21	3767	59 29 58	3749	60 45 53	3734
	α Arietis	E.	48 4 57	3306	46 40 52	3327	45 17 12	3349	43 53 57	3372
	Aldebaran	E.	78 30 38	3014	77 0 43	3021	75 30 56	3026	74 1 16	3032
7	α Aquilæ	W.	67 9 4	3676	68 26 17	3666	69 43 40	3658	71 1 12	3650
	α Arietis	E.	37 5 3	3520	35 45 1	3558	34 25 41	3601	33 7 8	3649
	Aldebaran	E.	66 34 31	3055	65 5 26	3059	63 36 26	3062	62 7 30	3065
8	α Aquilæ	W.	77 30 43	3620	78 48 56	3615	80 7 14	3610	81 25 37	3607
	Fomalhaut	W.	43 11 42	3669	44 29 2	3639	45 46 54	3611	47 5 16	3585
	Aldebaran	E.	54 43 34	3074	53 14 53	3074	51 46 12	3075	50 17 32	3075
	Mars	E.	95 1 56	3329	93 38 18	3329	92 14 40	3330	90 51 3	3330
	Sun	E.	122 39 59	3440	121 18 28	3440	119 56 57	3440	118 35 26	3440
9	Fomalhaut	W.	53 43 27	3482	55 4 11	3464	56 25 15	3447	57 46 38	3432
	α Pegasi	W.	40 41 24	3932	41 54 11	3880	43 7 51	3833	44 22 19	3790
	Aldebaran	E.	42 53 59	3068	41 25 10	3065	39 56 18	3062	38 27 22	3058
	Mars	E.	83 52 42	3321	82 28 55	3319	81 5 5	3315	79 41 11	3312
	Pollux	E.	87 7 14	3123	85 39 32	3120	84 11 47	3117	82 43 58	3113
	Sun	E.	111 47 40	3433	110 26 1	3430	109 4 18	3426	107 42 31	3423
10	Fomalhaut	W.	64 37 51	3358	66 0 56	3345	67 24 16	3331	68 47 52	3317
	α Pegasi	W.	50 45 3	3612	52 3 24	3582	53 22 18	3554	54 41 43	3527
	Aldebaran	E.	31 1 21	3034	29 31 50	3027	28 2 11	3020	26 32 23	3012
	Mars	E.	72 40 22	3284	71 15 52	3278	69 51 15	3270	68 26 29	3263

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
10	Pollux	E.	81° 16′ 4″	3110	79° 48′ 6″	3106	78° 20′ 4″	3101	76° 51′ 56″	3097
	Saturn	E.	87 55 15	3102	86 27 8	3097	84 58 55	3092	83 30 36	3087
	Sun	E.	106 20 40	3418	104 58 44	3413	103 36 42	3408	102 14 34	3400
11	Fomalhaut	W.	70 11 44	3303	71 35 52	3289	73 0 16	3276	74 24 55	3263
	α Pegasi	W.	56 1 37	3502	57 21 59	3477	58 42 49	3453	60 4 6	3430
	Mars	E.	67 1 34	3255	65 36 30	3246	64 11 15	3236	62 45 49	3227
	Pollux	E.	69 29 40	3067	68 0 50	3060	66 31 51	3053	65 2 44	3046
	Saturn	E.	76 7 7	3052	74 37 58	3043	73 8 39	3034	71 39 9	3026
	Sun	E.	95 21 58	3364	93 59 0	3355	92 35 52	3345	91 12 33	3336
12	Fomalhaut	W.	81 32 9	3196	82 58 23	3182	84 24 54	3168	85 51 41	3154
	α Pegasi	W.	66 56 51	3323	68 20 36	3302	69 44 45	3282	71 9 18	3262
	Mars	E.	55 35 40	3173	54 8 58	3161	52 42 2	3148	51 14 50	3135
	Pollux	E.	57 34 41	3004	56 4 33	2994	54 34 13	2985	53 3 42	2977
	Saturn	E.	64 8 37	2972	62 37 49	2961	61 6 47	2948	59 35 29	2935
	Sun	E.	84 12 54	3278	82 48 17	3265	81 23 25	3253	79 58 18	3239
13	α Arietis	W.	34 48 24	3309	36 12 25	3259	37 37 25	3212	39 3 20	3169
	Mars	E.	43 54 49	3065	42 25 57	3051	40 56 47	3035	39 27 18	3020
	Pollux	E.	45 28 17	2932	43 56 39	2924	42 24 50	2916	40 52 51	2909
	Saturn	E.	51 54 50	2867	50 21 49	2852	48 48 28	2836	47 14 47	2821
	Sun	E.	72 48 30	3164	71 21 38	3148	69 54 27	3133	68 26 57	3115
14	α Arietis	W.	46 24 58	2986	47 55 28	2955	49 26 37	2925	50 58 24	2896
	Mars	E.	31 55 4	2942	30 23 39	2927	28 51 54	2912	27 19 50	2897
	Pollux	E.	33 11 5	2890	31 38 33	2892	30 6 4	2898	28 33 42	2906
	Saturn	E.	39 21 20	2741	37 45 35	2725	36 9 28	2707	34 32 58	2690
	Sun	E.	61 4 11	3028	59 34 33	3009	58 4 32	2991	56 34 8	2973
15	α Arietis	W.	58 46 19	2763	60 21 36	2738	61 57 25	2714	63 33 46	2690
	Aldebaran	W.	25 13 26	2555	26 53 23	2537	28 33 45	2520	30 14 31	2502
	Sun	E.	48 56 16	2878	47 23 29	2859	45 50 18	2840	44 16 42	2821
16	α Arietis	W.	71 43 10	2582	73 22 30	2562	75 2 17	2543	76 42 31	2523
	Aldebaran	W.	38 44 35	2414	40 27 50	2396	42 11 30	2380	43 55 34	2363
	Sun	E.	36 22 32	2727	34 46 28	2709	33 10 0	2691	31 33 8	2673
20	**Sun**	W.	17 36 48	2362	19 21 18	2360	21 5 50	2359	22 50 23	2359
	Jupiter	E.	46 1 12	2134	44 11 5	2134	42 20 58	2136	40 30 53	2137
	Antares	E.	83 49 23	2132	81 59 12	2131	80 9 0	2131	78 18 48	2132
21	**Sun**	W.	31 32 54	2368	33 17 14	2372	35 1 29	2377	36 45 37	2382
	Jupiter	E.	31 21 42	2163	29 32 18	2171	27 43 7	2182	25 54 12	2194
	Antares	E.	69 8 31	2148	67 18 45	2153	65 29 7	2160	63 39 39	2167
22	**Sun**	W.	45 24 13	2415	47 7 26	2424	48 50 27	2433	50 33 15	2442
	Antares	E.	54 35 25	2216	52 47 21	2228	50 59 35	2241	49 12 9	2256
	α Aquilæ	E.	101 37 4	2663	99 59 35	2666	98 22 9	2669	96 44 47	2673
23	**Sun**	W.	59 3 51	2493	60 45 14	2504	62 26 21	2517	64 7 11	2529
	Venus	W.	25 56 28	2540	27 36 45	2522	29 17 28	2507	30 58 31	2497

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}.	P. L. of Diff.	XVIII^{h}.	P. L. of Diff.	XXI^{h}.	P. L. of Diff.
10	Pollux	E.	75° 23′ 43″	3091	73° 55′ 23″	3086	72° 26′ 56″	3080	70° 58′ 22″	3073
	Saturn	E.	82 2 10	3081	80 33 37	3074	79 4 56	3067	77 36 6	3060
	Sun	E.	100 52 18	3394	99 29 55	3388	98 7 25	3380	96 44 46	3372
11	Fomalhaut	W.	75 49 50	3249	77 15 1	3236	78 40 28	3222	80 6 11	3209
	α Pegasi	W.	61 25 49	3407	62 47 58	3386	64 10 31	3364	65 33 29	3343
	Mars	E.	61 20 12	3217	59 54 23	3207	58 28 22	3196	57 2 8	3184
	Pollux	E.	63 33 28	3038	62 4 2	3029	60 34 25	3021	59 4 38	3013
	Saturn	E.	70 9 28	3016	68 39 35	3005	67 9 29	2995	65 39 10	2984
	Sun	E.	89 49 3	3325	88 25 21	3314	87 1 26	3302	85 37 17	3290
12	Fomalhaut	W.	87 18 45	3141	88 46 5	3127	90 13 42	3114	91 41 35	3100
	α Pegasi	W.	72 34 14	3243	73 59 32	3225	75 25 12	3206	76 51 14	3187
	Mars	E.	49 47 23	3122	48 19 40	3108	46 51 40	3094	45 23 23	3080
	Pollux	E.	51 33 0	2968	50 2 7	2958	48 31 2	2949	46 59 45	2940
	Saturn	E.	58 3 55	2923	56 32 5	2909	54 59 58	2895	53 27 33	2881
	Sun	E.	78 32 55	3225	77 7 15	3210	75 41 18	3195	74 15 3	3180
13	α Arietis	W.	40 30 6	3129	41 57 41	3090	43 26 3	3054	44 55 9	3019
	Mars	E.	37 57 30	3005	36 27 23	2989	34 56 56	2973	33 26 10	2958
	Pollux	E.	39 20 43	2902	37 48 27	2897	36 16 4	2893	34 43 36	2891
	Saturn	E.	45 40 47	2806	44 6 27	2790	42 31 46	2774	40 56 44	2757
	Sun	E.	66 59 6	3098	65 30 54	3081	64 2 21	3064	62 33 27	3046
14	α Arietis	W.	52 30 48	2867	54 3 49	2840	55 37 25	2814	57 11 35	2788
	Mars	E.	25 47 27	2882	24 14 45	2869	22 41 46	2856	21 8 31	2845
	Pollux	E.	27 1 31	2920	25 29 38	2940	23 58 10	2969	22 27 18	3010
	Saturn	E.	32 56 5	2674	31 18 50	2657	29 41 13	2640	28 3 13	2624
	Sun	E.	55 3 21	2954	53 32 11	2935	52 0 37	2916	50 28 39	2897
15	α Arietis	W.	65 10 39	2668	66 48 2	2646	68 25 55	2624	70 4 18	2602
	Aldebaran	W.	31 55 42	2484	33 37 18	2466	35 19 19	2448	37 1 45	2431
	Sun	E.	42 42 41	2802	41 8 16	2783	39 33 26	2764	37 58 11	2746
16	α Arietis	W.	78 23 12	2505	80 4 18	2487	81 45 49	2470	83 27 45	2453
	Aldebaran	W.	45 40 2	2346	47 24 54	2331	49 10 9	2315	50 55 47	2300
	Sun	E.	29 55 52	2656	28 18 13	2638	26 40 10	2621	25 1 44	2605
20	Sun	W.	24 34 57	2359	26 19 30	2361	28 4 1	2363	29 48 29	2365
	Jupiter	E.	38 40 51	2140	36 50 53	2144	35 1 1	2149	33 11 17	2155
	Antares	E.	76 28 37	2133	74 38 28	2136	72 48 23	2139	70 58 24	2143
21	Sun	W.	38 29 38	2387	40 13 31	2394	41 57 15	2401	43 40 49	2408
	Jupiter	E.	24 5 35	2208	22 17 20	2226	20 29 31	2247	18 42 14	2274
	Antares	E.	61 50 22	2175	60 1 17	2184	58 12 25	2193	56 23 47	2204
22	Sun	W.	52 15 50	2451	53 58 12	2461	55 40 20	2472	57 22 13	2482
	Antares	E.	47 25 5	2272	45 38 24	2288	43 52 7	2307	42 6 17	2326
	α Aquilæ	E.	95 7 31	2679	93 30 23	2686	91 53 24	2695	90 16 37	2705
23	Sun	W.	65 47 44	2540	67 28 1	2553	69 8 1	2566	70 47 43	2578
	Venus	W.	32 39 48	2491	34 21 14	2487	36 2 46	2485	37 44 20	2485

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
23	Antares	E.	40° 20′ 55″	2347	38° 36′ 4″	2371	36° 51′ 47″	2396	35° 8′ 6″	2424
	α Aquilæ	E.	88 40 4	2716	87 3 46	2729	85 27 44	2741	83 51 59	2756
24	Sun	W.	72 27 8	2591	74 6 15	2604	75 45 4	2618	77 23 35	2632
	Venus	W.	39 25 54	2487	41 7 25	2490	42 48 52	2494	44 30 13	2499
	Spica	W.	22 16 48	2491	23 58 14	2476	25 40 1	2467	27 22 1	2461
	α Aquilæ	E.	75 58 37	2848	74 25 11	2869	72 52 13	2893	71 19 45	2918
25	Sun	W.	85 31 36	2698	87 8 18	2712	88 44 42	2726	90 20 47	2740
	Venus	W.	52 54 50	2535	54 35 14	2544	56 15 26	2553	57 55 26	2562
	Spica	W.	35 52 36	2472	37 34 29	2477	39 16 14	2485	40 57 49	2492
	Jupiter	W.	26 22 6	2486	28 3 39	2493	29 45 2	2501	31 26 14	2510
	α Aquilæ	E.	63 45 51	3064	62 16 57	3099	60 48 46	3136	59 21 20	3174
	Fomalhaut	E.	96 23 3	2654	94 45 21	2665	93 7 54	2676	91 30 42	2688
26	Sun	W.	98 16 45	2807	99 51 4	2821	101 25 5	2834	102 58 49	2846
	Venus	W.	66 12 11	2610	67 50 52	2621	69 29 19	2630	71 7 33	2640
	Spica	W.	49 22 51	2538	51 3 12	2547	52 43 20	2557	54 23 14	2567
	Jupiter	W.	39 48 51	2561	41 28 39	2572	43 8 12	2583	44 47 30	2595
	α Aquilæ	E.	52 16 43	3412	50 54 40	3470	49 33 42	3533	48 13 54	3599
	Fomalhaut	E.	83 28 58	2756	81 53 32	2770	80 18 25	2785	78 43 37	2800
27	Sun	W.	110 43 22	2910	112 15 28	2922	113 47 19	2935	115 18 54	2947
	Venus	W.	79 15 18	2691	80 52 10	2701	82 28 49	2710	84 5 15	2721
	Spica	W.	62 39 14	2618	64 17 44	2629	65 55 59	2640	67 34 0	2649
	Jupiter	W.	53 0 12	2649	54 38 0	2660	56 15 33	2672	57 52 51	2683
	Fomalhaut	E.	70 54 47	2883	69 22 6	2901	67 49 48	2920	66 17 55	2939
	α Pegasi	E.	86 0 50	2919	84 28 55	2932	82 57 17	2945	81 25 55	2959
28	Sun	W.	122 53 2	3005	124 23 8	3017	125 53 0	3027	127 22 39	3039
	Venus	W.	92 4 5	2769	93 39 13	2779	95 14 8	2789	96 48 50	2798
	Spica	W.	75 40 41	2700	77 17 21	2710	78 53 47	2719	80 30 1	2729
	Jupiter	W.	65 55 46	2735	67 31 39	2745	69 7 19	2755	70 42 46	2765
	Antares	W.	30 38 8	2899	32 10 28	2890	33 43 0	2883	35 15 41	2878
	Fomalhaut	E.	58 44 47	3046	57 15 31	3070	55 46 45	3096	54 18 31	3124
	α Pegasi	E.	73 53 44	3037	72 24 17	3053	70 55 10	3071	69 26 25	3089
29	Spica	W.	88 28 0	2776	90 2 59	2786	91 37 45	2795	93 12 19	2804
	Jupiter	W.	78 36 47	2813	80 10 58	2823	81 44 56	2832	83 18 42	2841
	Antares	W.	43 0 0	2875	44 32 51	2876	46 5 40	2880	47 38 25	2883
	Fomalhaut	E.	47 6 6	3284	45 41 36	3324	44 17 52	3365	42 54 56	3412
	α Pegasi	E.	62 8 28	3192	60 42 9	3215	59 16 18	3239	57 50 55	3265
30	Jupiter	W.	91 4 43	2884	92 37 22	2893	94 9 50	2901	95 42 7	2909
	Antares	W.	55 20 58	2905	56 53 11	2909	58 25 18	2915	59 57 18	2920
	Fomalhaut	E.	36 14 53	3716	34 58 23	3799	33 43 20	3891	32 29 51	3995
	α Pegasi	E.	50 52 7	3419	49 30 12	3455	48 8 58	3496	46 48 29	3538
	α Arietis	E.	92 32 12	2969	91 1 20	2977	89 30 39	2985	88 0 8	2993
31	Jupiter	W.	103 20 59	2950	104 52 15	2957	106 23 22	2965	107 54 19	2973
	Antares	W.	67 35 31	2950	69 6 47	2956	70 37 56	2961	72 8 58	2966
	α Arietis	E.	80 30 10	3036	79 0 42	3046	77 31 26	3055	76 2 21	3065

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
23	Antares	E.	33° 25′ 5″	2455	31° 42′ 48″	2489	30° 1′ 19″	2528	28° 20′ 45″	2573
	α Aquilæ	E.	82 16 34	2772	80 41 30	2789	79 6 48	2808	77 32 30	2827
24	Sun	W.	79 1 47	2644	80 39 42	2658	82 17 18	2672	83 54 36	2685
	Venus	W.	46 11 27	2505	47 52 33	2512	49 33 29	2520	51 14 15	2527
	Spica	W.	29 4 9	2459	30 46 20	2460	32 28 30	2462	34 10 36	2467
	α Aquilæ	E.	69 47 49	2944	68 16 26	2971	66 45 37	3001	65 15 25	3031
25	Sun	W.	91 56 34	2753	93 32 3	2766	95 7 15	2780	96 42 9	2794
	Venus	W.	59 35 13	2572	61 14 47	2581	62 54 8	2591	64 33 16	2600
	Spica	W.	42 39 14	2500	44 20 27	2509	46 1 28	2518	47 42 16	2527
	Jupiter	W.	33 7 13	2520	34 47 59	2530	36 28 31	2540	38 8 48	2551
	α Aquilæ	E.	57 54 40	3215	56 28 49	3260	55 3 51	3307	53 39 48	3358
	Fomalhaut	E.	89 53 46	2701	88 17 7	2714	86 40 46	2728	85 4 43	2741
26	Sun	W.	104 32 17	2859	106 5 28	2873	107 38 22	2885	109 11 0	2898
	Venus	W.	72 45 33	2650	74 23 20	2660	76 0 53	2671	77 38 12	2681
	Spica	W.	56 2 54	2577	57 42 20	2588	59 21 32	2598	61 0 30	2608
	Jupiter	W.	46 26 32	2606	48 5 19	2617	49 43 51	2627	51 22 9	2638
	α Aquilæ	E.	46 55 19	3673	45 38 3	3753	44 22 12	3840	43 7 51	3934
	Fomalhaut	E.	77 9 9	2816	75 35 2	2831	74 1 15	2848	72 27 50	2866
27	Sun	W.	116 50 13	2959	118 21 17	2970	119 52 7	2982	121 22 42	2994
	Venus	W.	85 41 27	2731	87 17 26	2741	88 53 12	2750	90 28 45	2760
	Spica	W.	69 11 48	2660	70 49 22	2670	72 26 42	2681	74 3 48	2690
	Jupiter	W.	59 29 54	2693	61 6 43	2704	62 43 18	2714	64 19 39	2725
	Fomalhaut	E.	64 46 26	2959	63 15 22	2979	61 44 43	3001	60 14 31	3023
	α Pegasi	E.	79 54 51	2973	78 24 5	2989	76 53 38	3005	75 23 31	3021
28	Sun	W.	128 52 4	3049	130 21 16	3060	131 50 14	3071	133 18 59	3082
	Venus	W.	98 23 20	2808	99 57 37	2818	101 31 42	2828	103 5 34	2837
	Spica	W.	82 6 2	2739	83 41 50	2748	85 17 26	2758	86 52 49	2767
	Jupiter	W.	72 18 0	2775	73 53 1	2785	75 27 49	2795	77 2 24	2804
	Antares	W.	36 48 28	2875	38 21 19	2873	39 54 13	2873	41 27 7	2873
	Fomalhaut	E.	52 50 50	3152	51 23 43	3182	49 57 12	3214	48 31 19	3247
	α Pegasi	E.	67 58 2	3108	66 30 2	3128	65 2 26	3148	63 35 14	3169
29	Spica	W.	94 46 42	2813	96 20 53	2822	97 54 52	2831	99 28 40	2839
	Jupiter	W.	84 52 17	2850	86 25 40	2859	87 58 52	2867	89 31 53	2876
	Antares	W.	49 11 6	2887	50 43 42	2891	52 16 13	2895	53 48 38	2899
	Fomalhaut	E.	41 32 53	3463	40 11 47	3517	38 51 42	3576	37 32 42	3642
	α Pegasi	E.	56 26 2	3292	55 1 41	3321	53 37 54	3351	52 14 42	3384
30	Jupiter	W.	97 14 14	2917	98 46 11	2926	100 17 57	2934	101 49 33	2942
	Antares	W.	61 29 11	2926	63 0 57	2931	64 32 36	2938	66 4 7	2943
	Fomalhaut	E.	31 18 6	4112	30 8 16	4246	29 0 33	4398	27 55 10	4575
	α Pegasi	E.	45 28 47	3585	44 9 56	3635	42 52 0	3690	41 35 2	3749
	α Arietis	E.	86 29 47	3002	84 59 37	3010	83 29 37	3019	81 59 48	3028
31	Jupiter	W.	109 25 6	2980	110 55 44	2987	112 26 13	2994	113 56 33	3001
	Antares	W.	73 39 53	2973	75 10 40	2979	76 41 19	2985	78 11 50	2991
	α Arietis	E.	74 33 28	3073	73 4 46	3083	71 36 16	3093	70 7 58	3104

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	10 41 15.94	9.069	N. 8 18 48.0	–54.41	15 53.68	64.42	0 3.85	0.785
Frid.	2	10 44 53.45	9.057	7 56 58.2	54.74	15 53.91	64.38	0 22.85	0.797
Sat.	3	10 48 30.68	9.046	7 35 0.7	55.05	15 54.15	64.34	0 42.12	0.808
SUN.	4	10 52 7.65	9.036	7 12 55.9	–55.35	15 54.38	64.30	1 1.65	0.818
Mon.	5	10 55 44.37	9.026	6 50 44.0	55.64	15 54.62	64.26	1 21.42	0.828
Tues.	6	10 59 20.87	9.017	6 28 25.3	55.92	15 54.86	64.22	1 41.42	0.837
Wed.	7	11 2 57.18	9.009	6 6 0.2	–56.18	15 55.10	64.19	2 1.61	0.844
Thur.	8	11 6 33.31	9.002	5 43 29.0	56.43	15 55.34	64.17	2 21.98	0.852
Frid.	9	11 10 9.28	8.996	5 20 51.9	56.66	15 55.58	64.14	2 42.50	0.858
Sat.	10	11 13 45.12	8.991	4 58 9.3	–56.88	15 55.82	64.12	3 3.15	0.863
SUN.	11	11 17 20.85	8.987	4 35 21.6	57.08	15 56.07	64.10	3 23.91	0.867
Mon.	12	11 20 56.48	8.983	4 12 28.9	57.28	15 56.32	64.08	3 44.78	0.871
Tues.	13	11 24 32.02	8.980	3 49 31.8	–57.46	15 56.57	64.07	4 5.73	0.874
Wed.	14	11 28 7.50	8.978	3 26 30.5	57.63	15 56.82	64.06	4 26.75	0.876
Thur.	15	11 31 42.94	8.976	3 3 25.4	57.78	15 57.08	64.05	4 47.81	0.878
Frid.	16	11 35 18.35	8.975	2 40 16.7	–57.92	15 57.34	64.05	5 8.91	0.879
Sat.	17	11 38 53.73	8.975	2 17 4.8	58.05	15 57.60	64.05	5 30.01	0.879
SUN.	18	11 42 29.12	8.976	1 53 50.1	58.16	15 57.86	64.06	5 51.12	0.878
Mon.	19	11 46 4.53	8.977	1 30 33.0	–58.25	15 58.13	64.06	6 12.20	0.877
Tues.	20	11 49 39.99	8.979	1 7 13.8	58.33	15 58.40	64.07	6 33.24	0.875
Wed.	21	11 53 15.49	8.981	0 43 52.9	58.40	15 58 67	64.08	6 54.23	0.873
Thur.	22	11 56 51.05	8.984	N. 0 20 30.6	–58.45	15 58.94	64.09	7 15.16	0.870
Frid.	23	12 0 26.71	8.988	S. 0 2 52.7	58.48	15 59.22	64.11	7 36.00	0.866
Sat.	24	12 4 2.47	8.993	0 26 16.7	58.50	15 59.50	64.13	7 56.74	0.861
SUN.	25	12 7 38.36	8.999	0 49 41.0	–58.51	15 59.78	64.15	8 17.34	0.855
Mon.	26	12 11 14.40	9.006	1 13 5.3	58.50	16 0.06	64.18	8 37.80	0.848
Tues.	27	12 14 50.61	9.013	1 36 29.2	58.48	16 0.34	64.21	8 58.09	0.841
Wed.	28	12 18 27.01	9.022	1 59 52.4	–58.44	16 0.62	64.24	9 18.19	0.832
Thur.	29	12 22 3.62	9.031	2 23 14.6	58.39	16 0.90	64.28	9 38.07	0.823
Frid.	30	12 25 40.47	9.041	2 46 35.4	58.32	16 1.18	64.32	9 57.72	0.813
Sat.	31	12 29 17.58	9.052	S. 3 9 54.4	–58.25	16 1.46	64.36	10 17.11	0.802

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^{s}.18$ from the sidereal time.
The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations, increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	10 41 15.95	9.071	N. 8 18 48.0	–54.42	0 3.85	0.785	10 41 19.80
Frid.	2	10 44 53.50	9.059	7 56 57.9	54.75	0 22.85	0.797	10 45 16.36
Sat.	3	10 48 30.78	9.048	7 35 0.1	55.06	0 42.13	0.808	10 49 12.91
SUN.	4	10 52 7.80	9.038	7 12 55.0	–55.36	1 1.66	0.818	10 53 9.46
Mon.	5	10 55 44.57	9.028	6 50 42.8	55.65	1 21.44	0.828	10 57 6.01
Tues.	6	10 59 21.12	9.019	6 28 23.8	55.93	1 41.44	0.837	11 1 2.57
Wed.	7	11 2 57.48	9.011	6 5 58.4	–56.19	2 1.64	0.844	11 4 59.12
Thur.	8	11 6 33.66	9.004	5 43 26.8	56.44	2 22.01	0.852	11 8 55.67
Frid.	9	11 10 9.69	8.998	5 20 49.4	56.67	2 42.53	0.858	11 12 52.22
Sat.	10	11 13 45.58	8.993	4 58 6.5	–56.89	3 3.19	0.863	11 16 48.77
SUN.	11	11 17 21.36	8.989	4 35 18.4	57.10	3 23.96	0.867	11 20 45.32
Mon.	12	11 20 57.04	8.985	4 12 25.4	57.30	3 44.83	0.871	11 24 41.87
Tues.	13	11 24 32.63	8.982	3 49 27.9	–57.48	4 5.79	0.874	11 28 38.42
Wed.	14	11 28 8.16	8.980	3 26 26.3	57.65	4 26.82	0.876	11 32 34.98
Thur.	15	11 31 43.65	8.978	3 3 20.8	57.80	4 47.88	0.878	11 36 31.53
Frid.	16	11 35 19.11	8.977	2 40 11.7	–57.94	5 8.98	0.879	11 40 28.09
Sat.	17	11 38 54.55	8.977	2 16 59.5	58.07	5 30.09	0.879	11 44 24.64
SUN.	18	11 42 29.99	8.978	1 53 44.5	58.18	5 51.20	0.879	11 48 21.19
Mon.	19	11 46 5.45	8.979	1 30 27.1	–58.27	6 12.29	0.877	11 52 17.74
Tues.	20	11 49 40.96	8.981	1 7 7.5	58.35	6 33.33	0.875	11 56 14.29
Wed.	21	11 53 16.52	8.983	0 43 46.2	58.42	6 54.32	0.873	12 0 10.84
Thur.	22	11 56 52.13	8.986	N. 0 20 23 6	–58.47	7 15.26	0.870	12 4 7.40
Frid.	23	12 0 27.84	8.990	S. 0 3 0.1	58.50	7 36.11	0.866	12 8 3.95
Sat.	24	12 4 3.65	8.995	0 26 24.4	58.52	7 56.85	0.861	12 12 0.51
SUN.	25	12 7 39.60	9.001	0 49 49.1	–58.53	8 17.46	0.855	12 15 57.06
Mon.	26	12 11 15.69	9.008	1 13 13.7	58.52	8 37.92	0.848	12 19 53.61
Tues.	27	12 14 51.95	9.015	1 36 38.0	58.50	8 58.21	0.841	12 23 50.16
Wed.	28	12 18 28.40	9.024	2 0 1.5	–58.46	9 18.31	0.832	12 27 46.71
Thur.	29	12 22 5.07	9.033	2 23 24.0	58.41	9 38.19	0.823	12 31 43.26
Frid.	30	12 25 41.97	9.043	2 46 45.1	58.34	9 57.85	0.813	12 35 39.82
Sat.	31	12 29 19.13	9.054	S. 3 10 4.4	–58.26	10 17.24	0.802	12 39 36.37

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign – prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations, increasing.

Diff. for 1 Hour,
+ 9ˢ.8565.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	244	158 42 10.3	41 47.7	145.22	+ 0.16	0.0037695	- 44.1	13 16 29.36
2	245	159 40 16.3	39 53.6	145.29	+ 0.03	0.0036634	44.3	13 12 33.45
3	246	160 38 24.0	38 1.2	145.36	— 0.09	0.0035569	44.5	13 8 37.54
4	247	161 36 33.5	36 10.6	145.43	— 0.19	0.0034499	- 44.7	13 4 41.64
5	248	162 34 44.8	34 21.8	145.51	0.26	0.0033424	44.9	13 0 45.73
6	249	163 32 58.0	32 34.9	145.59	0.31	0.0032344	45.1	12 56 49.82
7	250	164 31 13.2	30 50.1	145.67	— 0.33	0.0031258	- 45.4	12 52 53.92
8	251	165 29 30.4	29 7.2	145.76	0.32	0.0030166	45.7	12 48 58.01
9	252	166 27 49.7	27 26.4	145.85	0.28	0.0029066	46.0	12 45 2.10
10	253	167 26 11.2	25 47.8	145.94	— 0.21	0.0027958	- 46.4	12 41 6.19
11	254	168 24 34.7	24 11.2	146.02	0.12	0.0026841	46.8	12 37 10.29
12	255	169 23 0.3	22 36.7	146.11	— 0.01	0.0025714	47.2	12 33 14.40
13	256	170 21 28.0	21 4.3	146.20	+ 0.12	0.0024576	- 47.7	12 29 18.49
14	257	171 19 57.9	19 34.1	146.29	0.26	0.0023426	48.2	12 25 22.58
15	258	172 18 29.9	18 6.0	146.38	0.41	0.0022264	48.7	12 21 26.67
16	259	173 17 3.9	16 39.9	146.46	+ 0.54	0.0021088	- 49.2	12 17 30.76
17	260	174 15 39.9	15 15.9	146.54	0.65	0.0019898	49.8	12 13 34.85
18	261	175 14 17.9	13 53.8	146.62	0.74	0.0018696	50.3	12 9 38.94
19	262	176 12 57.8	12 33.6	146.70	+ 0.81	0.0017484	- 50.7	12 5 43.04
20	263	177 11 39.5	11 15.2	146.78	0.86	0.0016262	51.2	12 1 47.14
21	264	178 10 23.0	9 58.6	146.85	0.88	0.0015028	51.6	11 57 51.23
22	265	179 9 8.2	8 43.8	146.92	+ 0.86	0.0013784	- 52.0	11 53 55.32
23	266	180 7 55.1	7 30.6	146.99	0.81	0.0012532	52.3	11 49 59.42
24	267	181 6 43.8	6 19.2	147.07	0.74	0.0011274	52.5	11 46 3.51
25	268	182 5 34.3	5 9.5	147.14	+ 0.64	0.0010011	- 52.7	11 42 7.60
26	269	183 4 26.4	4 1.6	147.21	0.52	0.0008745	52.8	11 38 11.69
27	270	184 3 20.3	2 55.5	147.28	0.40	0.0007479	52.8	11 34 15.79
28	271	185 2 16.0	1 51.1	147.35	+ 0.27	0.0006213	- 52.8	11 30 19.89
29	272	186 1 13.5	0 48.5	147.43	0.15	0.0004948	52.7	11 26 23.98
30	273	186 60 12.8	59 47.7	147.51	+ 0.03	0.0003686	52.5	11 22 28.07
31	274	187 59 14.0	58 48.8	147.59	— 0.08	0.0002428	- 52.3	11 18 32.17

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, — $9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 58.2	14 55.4	54 49.4	–0.89	54 39.2	–0.81	11 41.7	1.87	13.3
2	14 52.9	14 50.7	54 30.0	0.72	54 21.9	0.63	12 25.9	1.80	14.3
3	14 48.8	14 47.2	54 14.9	0.53	54 9.1	0.42	13 8.6	1.76	15.3
4	14 46.0	14 45.2	54 4.7	–0.30	54 1.8	–0.18	13 50.6	1.74	16.3
5	14 44.9	14 45.0	54 0.5	–0.04	54 0.9	+0.11	14 32.5	1.75	17.3
6	14 45.6	14 46.7	54 3.2	+0.27	54 7.4	0.44	15 14.8	1.79	18.3
7	14 48.4	14 50.8	54 13.7	+0.62	54 22.2	+0.80	15 58.4	1.85	19.3
8	14 53.7	14 57.3	54 33.0	1.00	54 46.2	1.20	16 43.7	1.94	20.3
9	15 1.5	15 6.4	55 1.7	1.39	55 19.5	1.58	17 31.4	2.04	21.3
10	15 11.8	15 17.9	55 39.6	+1.76	56 1.8	+1.93	18 21.6	2.15	22.3
11	15 24.5	15 31.5	56 26.0	2.09	56 51.9	2.22	19 14.4	2.25	23.3
12	15 39.0	15 46.7	57 19.3	2.33	57 47.7	2.38	20 9.2	2.32	24.3
13	15 54.6	16 2.4	58 16.5	+2.40	58 45.3	+2.38	21 5.4	2.36	25.3
14	16 10.1	16 17.4	59 13.5	2.29	59 40.3	2.15	22 2.1	2.36	26.3
15	16 24.1	16 30.1	60 5.0	1.94	60 26.9	1.68	22 58.7	2.34	27.3
16	16 35.1	16 39.0	60 45.3	+1.37	60 59.8	+1.02	23 54.6	2.32	28.3
17	16 41.7	16 43.2	61 9.8	+0.63	61 15.0	+0.23	δ		29.3
18	16 43.2	16 42.0	61 15.3	-0.18	61 10.7	-0.58	0 50.1	2.30	0.9
19	16 39.5	16 35.8	61 1.5	-0.94	60 48.1	-1.27	1 45.4	2.30	1.9
20	16 31.2	16 25.7	60 31.0	1.55	60 10.9	1.78	2 40.7	2.30	2.9
21	16 19.6	16 12.9	59 48.3	1.96	59 24.0	2.08	3 36.2	2.32	3.9
22	16 6.0	15 58.9	58 58.5	-2.15	58 32.5	-2.17	4 31.8	2.32	4.9
23	15 51.8	15 44.8	58 6.4	2.15	57 40.8	2.10	5 27.1	2.29	5.9
24	15 38.1	15 31.6	57 16.0	2.02	56 52.3	1.92	6 21.5	2.24	6.9
25	15 25.5	15 19.8	56 29 9	-1.81	56 9.0	-1.68	7 14.4	2.16	7.9
26	15 14.6	15 9.7	55 49.6	1.55	55 31.9	1.41	8 5.1	2.06	8.9
27	15 5.4	15 1.4	55 15.8	1.27	55 1.4	1.14	8 53.5	1.97	9.9
28	14 57.9	14 54.8	54 48.5	-1.01	54 37.2	-0.88	9 39.8	1.88	10.9
29	14 52.2	14 49.9	54 27.4	0.75	54 19.1	0.64	10 24.1	1.81	11.9
30	14 48.0	14 46.5	54 12.1	0.53	54 6.4	0.42	11 7.0	1.76	12.9
31	14 45.3	14 44.4	54 2.0	-0.31	53 58.9	-0.20	11 49.0	1.74	13.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 1 35.01	2.0179	S. 12 58 4.0	7.934
1	22 3 35.99	2.0148	12 50 6.3	7.988
2	22 5 36.78	2.0117	12 42 5.4	8.042
3	22 7 37.39	2.0086	12 34 1.3	8.095
4	22 9 37.81	2.0054	12 25 54.0	8.147
5	22 11 38.04	2.0023	12 17 43.7	8.197
6	22 13 38.08	1.9992	12 9 30.4	8.247
7	22 15 37.94	1.9962	12 1 14.1	8.297
8	22 17 37.62	1.9932	11 52 54.8	8.346
9	22 19 37.12	1.9902	11 44 32.6	8.394
10	22 21 36.44	1.9872	11 36 7.5	8.442
11	22 23 35.58	1.9842	11 27 39.6	8.488
12	22 25 34.54	1.9812	11 19 9.0	8.533
13	22 27 33.33	1.9783	11 10 35.6	8.579
14	22 29 31.94	1.9754	11 1 59.5	8.623
15	22 31 30.38	1.9726	10 53 20.8	8.666
16	22 33 28.65	1.9698	10 44 39.5	8.709
17	22 35 26.75	1.9670	10 35 55.7	8.752
18	22 37 24.69	1.9642	10 27 9.3	8.793
19	22 39 22.46	1.9615	10 18 20.5	8.833
20	22 41 20.07	1.9587	10 9 29.3	8.874
21	22 43 17.51	1.9560	10 0 35.6	8.914
22	22 45 14.79	1.9533	9 51 39.6	8.952
23	22 47 11.91	1.9507	S. 9 42 41.3	8.990

FRIDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 49 8.88	1.9482	S. 9 33 40.8	9.027
1	22 51 5.69	1.9456	9 24 38.1	9.063
2	22 53 2.35	1.9430	9 15 33.2	9.099
3	22 54 58.85	1.9404	9 6 26.2	9.134
4	22 56 55.20	1.9380	8 57 17.1	9.169
5	22 58 51.41	1.9356	8 48 5.9	9.203
6	23 0 47.47	1.9332	8 38 52.7	9.236
7	23 2 43.39	1.9307	8 29 37.6	9.268
8	23 4 39.16	1.9283	8 20 20.6	9.299
9	23 6 34.79	1.9260	8 11 1.7	9.330
10	23 8 30.28	1.9237	8 1 41.0	9.360
11	23 10 25.64	1.9215	7 52 18.5	9.390
12	23 12 20.86	1.9193	7 42 54.2	9.419
13	23 14 15.95	1.9171	7 33 28.2	9.447
14	23 16 10.91	1.9149	7 24 0.6	9.473
15	23 18 5.74	1.9128	7 14 31.4	9.500
16	23 20 0.45	1.9107	7 5 0.6	9.527
17	23 21 55.03	1.9087	6 55 28.2	9.553
18	23 23 49.49	1.9067	6 45 54.3	9.577
19	23 25 43.83	1.9047	6 36 19.0	9.600
20	23 27 38.05	1.9027	6 26 42.3	9.623
21	23 29 32.15	1.9007	6 17 4.2	9.646
22	23 31 26.14	1.8989	6 7 24.7	9.669
23	23 33 20.02	1.8972	5 57 43.9	9.690
24	23 35 13.80	1.8954	S. 5 48 1.9	9.710

SATURDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 35 13.80	1.8954	S. 5 48 1.9	9.710
1	23 37 7.47	1.8936	5 38 18.7	9.730
2	23 39 1.03	1.8918	5 28 34.3	9.750
3	23 40 54.49	1.8901	5 18 48.7	9.769
4	23 42 47.85	1.8885	5 9 2.0	9.787
5	23 44 41.11	1.8869	4 59 14.3	9.803
6	23 46 34.28	1.8853	4 49 25.6	9.820
7	23 48 27.35	1.8838	4 39 35.9	9.837
8	23 50 20.34	1.8824	4 29 45.2	9.853
9	23 52 13.24	1.8809	4 19 53.6	9.867
10	23 54 6.05	1.8795	4 10 1.2	9.881
11	23 55 58.78	1.8782	4 0 7.9	9.895
12	23 57 51.43	1.8768	3 50 13.8	9.907
13	23 59 44.00	1.8755	3 40 19.0	9.919
14	0 1 36.49	1.8743	3 30 23.5	9.931
15	0 3 28.91	1.8731	3 20 27.3	9.942
16	0 5 21.26	1.8719	3 10 30.5	9.952
17	0 7 13.54	1.8708	3 0 33.1	9.962
18	0 9 5.75	1.8697	2 50 35.1	9.971
19	0 10 57.90	1.8687	2 40 36.6	9.979
20	0 12 49.99	1.8677	2 30 37.6	9.986
21	0 14 42.02	1.8667	2 20 38.2	9.993
22	0 16 33.99	1.8657	2 10 38.4	10.000
23	0 18 25.90	1.8648	S. 2 0 38.2	10.007

SUNDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 20 17.76	1.8640	S. 1 50 37.6	10.012
1	0 22 9.58	1.8632	1 40 36.7	10.017
2	0 24 1.35	1.8624	1 30 35.6	10.020
3	0 25 53.07	1.8617	1 20 34.3	10.023
4	0 27 44.75	1.8610	1 10 32.8	10.026
5	0 29 36.39	1.8604	1 0 31.2	10.028
6	0 31 28.00	1.8599	0 50 29.4	10.030
7	0 33 19.58	1.8593	0 40 27.6	10.031
8	0 35 11.12	1.8588	0 30 25.7	10.032
9	0 37 2.63	1.8583	0 20 23.8	10.032
10	0 38 54.12	1.8579	0 10 21.9	10.031
11	0 40 45.58	1.8575	S. 0 0 20.1	10.029
12	0 42 37.02	1.8572	N. 0 9 41.6	10.027
13	0 44 28.44	1.8569	0 19 43.1	10.024
14	0 46 19.85	1.8567	0 29 44.5	10.021
15	0 48 11.24	1.8564	0 39 45.7	10.017
16	0 50 2.62	1.8563	0 49 46.6	10.012
17	0 51 54.00	1.8562	0 59 47.2	10.008
18	0 53 45.37	1.8561	1 9 47.6	10.003
19	0 55 36.73	1.8560	1 19 47.6	9.997
20	0 57 28.09	1.8561	1 29 47.2	9.990
21	0 59 19.46	1.8562	1 39 46.4	9.982
22	1 1 10.83	1.8563	1 49 45.1	9.974
23	1 3 2.21	1.8564	1 59 43.3	9.966
24	1 4 53.60	1.8566	N. 2 9 41.0	9.957

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 5.					WEDNESDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 4 53.60	1.8566	N. 2 9 41.0	9.957	0	2 35 3.00	1.9165	N. 9 46 5.0	8.836
1	1 6 45.00	1.8568	2 19 38.2	9.947	1	2 36 58.06	1.9188	9 54 54.0	8.798
2	1 8 36.42	1.8571	2 29 34.7	9.937	2	2 38 53.26	1.9211	10 3 40.7	8.760
3	1 10 27.85	1.8574	2 39 30.6	9.926	3	2 40 48.59	1.9234	10 12 25.2	8.722
4	1 12 19.30	1.8578	2 49 25.8	9.914	4	2 42 44.07	1.9258	10 21 7.3	8.682
5	1 14 10.78	1.8582	2 59 20.3	9.902	5	2 44 39.69	1.9282	10 29 47.0	8.641
6	1 16 2.28	1.8586	3 9 14.1	9.890	6	2 46 35.46	1.9307	10 38 24.2	8.600
7	1 17 53.81	1.8591	3 19 7.1	9.876	7	2 48 31.38	1.9332	10 46 59.0	8.559
8	1 19 45.37	1.8597	3 28 59.3	9.862	8	2 50 27.45	1.9358	10 55 31.3	8.517
9	1 21 36.97	1.8602	3 38 50.6	9.848	9	2 52 23.68	1.9385	11 4 1.0	8.474
10	1 23 28.60	1.8608	3 48 41.1	9.834	10	2 54 20.07	1.9412	11 12 28.1	8.431
11	1 25 20.27	1.8615	3 58 30.7	9.818	11	2 56 16.62	1.9438	11 20 52.7	8.388
12	1 27 11.98	1.8622	4 8 19.3	9.802	12	2 58 13.33	1.9465	11 29 14.7	8.344
13	1 29 3.74	1.8630	4 18 6.9	9.785	13	3 0 10.20	1.9493	11 37 34.0	8.298
14	1 30 55.54	1.8638	4 27 53.5	9.768	14	3 2 7.24	1.9521	11 45 50.5	8.252
15	1 32 47.39	1.8646	4 37 39.1	9.751	15	3 4 4.45	1.9549	11 54 4.2	8.205
16	1 34 39.29	1.8655	4 47 23.6	9.732	16	3 6 1.83	1.9577	12 2 15.1	8.158
17	1 36 31.25	1.8664	4 57 7.0	9.713	17	3 7 59.38	1.9606	12 10 23.2	8.111
18	1 38 23.26	1.8673	5 6 49.2	9.693	18	3 9 57.10	1.9635	12 18 28.4	8.063
19	1 40 15.33	1.6684	5 16 30.2	9.673	19	3 11 55.00	1.9665	12 26 30.7	8.014
20	1 42 7.47	1.8695	5 26 10.0	9.652	20	3 13 53.08	1.9696	12 34 30.1	7.965
21	1 43 59.67	1.8705	5 35 48.5	9.631	21	3 15 51.35	1.9727	12 42 26.5	7.915
22	1 45 51.93	1.6717	5 45 25.7	9.609	22	3 17 49.80	1.9757	12 50 19.8	7.863
23	1 47 44.27	1.8729	N. 5 55 1.6	9.587	23	3 19 48.43	1.9788	N.12 58 10.0	7.811
	TUESDAY 6.					THURSDAY 8.			
0	1 49 36.68	1.8742	N. 6 4 36.2	9.565	0	3 21 47.25	1.9819	N.13 5 57.1	7.759
1	1 51 29.17	1.8754	6 14 9.4	9.541	1	3 23 46.26	1.9851	13 13 41.1	7.707
2	1 53 21.73	1.8767	6 23 41.1	9.516	2	3 25 45.46	1.9883	13 21 21.9	7.653
3	1 55 14.37	1.8781	6 33 11.3	9.491	3	3 27 44.86	1.9916	13 28 59.5	7.599
4	1 57 7.10	1.8795	6 42 40.0	9.466	4	3 29 44.45	1.9948	13 36 33.8	7.544
5	1 58 59.91	1.8809	6 52 7.2	9.440	5	3 31 44.24	1.9981	13 44 4.8	7.489
6	2 0 52.81	1.8824	7 1 32.8	9.414	6	3 33 44.22	2.0014	13 51 32.5	7.433
7	2 2 45.80	1.8840	7 10 56.8	9.387	7	3 35 44.41	2.0048	13 58 56.8	7.377
8	2 4 38.89	1.8856	7 20 19.2	9.359	8	3 37 44.80	2.0082	14 6 17.7	7.319
9	2 6 32.07	1.8872	7 29 39.9	9.331	9	3 39 45.40	2.0117	14 13 35.1	7.261
10	2 8 25.35	1.8888	7 38 58.9	9.302	10	3 41 46.21	2.0152	14 20 49.0	7.202
11	2 10 18.73	1.8905	7 48 16.1	9.272	11	3 43 47.22	2.0186	14 27 59.4	7.143
12	2 12 12.21	1.8923	7 57 31.6	9.242	12	3 45 48.44	2.0221	14 35 6.2	7.083
13	2 14 5.80	1.8941	8 6 45.2	9.212	13	3 47 49.88	2.0257	14 42 9.4	7.022
14	2 15 59.50	1.8959	8 15 57.0	9.181	14	3 49 51.53	2.0292	14 49 8.9	6.961
15	2 17 53.31	1.8977	8 25 6.9	9.149	15	3 51 53.39	2.0328	14 56 4.7	6.899
16	2 19 47.23	1.8997	8 34 14.9	9.117	16	3 53 55.47	2.0365	15 2 56.7	6.836
17	2 21 41.27	1.9017	8 43 20.9	9.084	17	3 55 57.77	2.0401	15 9 45.0	6.773
18	2 23 35.43	1.9037	8 52 24.9	9.050	18	3 58 0.28	2.0437	15 16 29.5	6.709
19	2 25 29.71	1.9057	9 1 26.9	9.016	19	4 0 3.01	2.0474	15 23 10.1	6.644
20	2 27 24.11	1.9077	9 10 26.8	8.981	20	4 2 5.97	2.0512	15 29 46.8	6.578
21	2 29 18.64	1.9098	9 19 24.6	8.945	21	4 4 9.16	2.0550	15 36 19.5	6.512
22	2 31 13.29	1.9120	9 28 20.2	8.909	22	4 6 12.57	2.0587	15 42 48.2	6.445
23	2 33 8.08	1.9142	9 37 13.7	8.873	23	4 8 16.21	2.0625	15 49 12.9	6.377
24	2 35 3.00	1.9165	N. 9 46 5.0	8.836	24	4 10 20.07	2.0663	N.15 55 33.5	6.309

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 9.					**SUNDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 10 20.07	2.0663	N.15 55 33.5	6.309	0	5 54 8.36	2.2594	N.19 26 19.2	2.202
1	4 12 24.16	2.0701	16 1 50.0	6.240	1	5 56 24.04	2.2633	19 28 28.3	2.100
2	4 14 28.48	2.0740	16 8 2.3	6.171	2	5 58 39.95	2.2672	19 30 31.2	1.997
3	4 16 33.04	2.0779	16 14 10.5	6.101	3	6 0 56.10	2.2710	19 32 27.9	1.893
4	4 18 37.83	2.0818	16 20 14.4	6.029	4	6 3 12.47	2.2747	19 34 18.3	1.788
5	4 20 42.85	2.0857	16 26 14.0	5.957	5	6 5 29.07	2.2785	19 36 2.5	1.684
6	4 22 48.11	2.0897	16 32 9.2	5.884	6	6 7 45.89	2.2822	19 37 40.4	1.578
7	4 24 53.61	2.0936	16 38 0.0	5.811	7	6 10 2.94	2.2860	19 39 11.9	1.472
8	4 26 59.34	2.0975	16 43 46.5	5.738	8	6 12 20.21	2.2897	19 40 37.0	1.365
9	4 29 5.31	2.1015	16 49 28.6	5.664	9	6 14 37.70	2.2933	19 41 55.7	1.257
10	4 31 11.52	2.1055	16 55 6.2	5.588	10	6 16 55.41	2.2970	19 43 7.9	1.149
11	4 33 17.97	2.1095	17 0 39.2	5.512	11	6 19 13.34	2.3006	19 44 13.6	1.042
12	4 35 24.66	2.1135	17 6 7.6	5.435	12	6 21 31.48	2.3042	19 45 12.9	0.933
13	4 37 31.59	2.1176	17 11 31.4	5.357	13	6 23 49.84	2.3077	19 46 5.6	0.823
14	4 39 38.77	2.1217	17 16 50.5	5.279	14	6 26 8.41	2.3112	19 46 51.7	0.712
15	4 41 46.19	2.1257	17 22 4.9	5.201	15	6 28 27.18	2.3146	19 47 31.1	0.602
16	4 43 53.85	2.1297	17 27 14.6	5.121	16	6 30 46.16	2.3181	19 48 3.9	0.491
17	4 46 1.75	2.1337	17 32 19.4	5.040	17	6 33 5.35	2.3215	19 48 30.0	0.379
18	4 48 9.90	2.1378	17 37 19.4	4.959	18	6 35 24.74	2.3248	19 48 49.3	0.266
19	4 50 18.29	2.1419	17 42 14.5	4.878	19	6 37 44.33	2.3282	19 49 1.9	0.153
20	4 52 26.93	2.1461	17 47 4.7	4.796	20	6 40 4.12	2.3315	19 49 7.7	+0.041
21	4 54 35.82	2.1502	17 51 50.0	4.713	21	6 42 24.11	2.3347	19 49 6.8	−0.072
22	4 56 44.95	2.1542	17 56 30.3	4.629	22	6 44 44.29	2.3379	19 48 59.0	0.187
23	4 58 54.33	2.1583	N.18 1 5.5	4.543	23	6 47 4.66	2.3410	N.19 48 44.3	0.302
	SATURDAY 10.					**MONDAY 12.**			
0	5 1 3.95	2.1624	N.18 5 35.5	4.458	0	6 49 25.21	2.3441	N.19 48 22.7	0.417
1	5 3 13.82	2.1666	18 10 0.4	4.373	1	6 51 45.95	2.3472	19 47 54.2	0.532
2	5 5 23.94	2.1707	18 14 20.2	4.287	2	6 54 6.88	2.3503	19 47 18.8	0.648
3	5 7 34.30	2.1748	18 18 34.8	4.199	3	6 56 27.99	2.3533	19 46 36.4	0.765
4	5 9 44.91	2.1789	18 22 44.1	4.111	4	6 58 49.28	2.3562	19 45 47.0	0.882
5	5 11 55.77	2.1830	18 26 48.1	4.022	5	7 1 10.74	2.3591	19 44 50.6	0.999
6	5 14 6.87	2.1871	18 30 46.7	3.932	6	7 3 32.37	2.3619	19 43 47.1	1.117
7	5 16 18.22	2.1912	18 34 39.9	3.842	7	7 5 54.17	2.3647	19 42 36.6	1.234
8	5 18 29.82	2.1953	18 38 27.7	3.751	8	7 8 16.14	2.3675	19 41 19.0	1.352
9	5 20 41.66	2.1994	18 42 10.0	3.659	9	7 10 38.27	2.3702	19 39 54.3	1.471
10	5 22 53.75	2.2035	18 45 46.8	3.567	10	7 13 0.56	2.3728	19 38 22.5	1.590
11	5 25 6.08	2.2075	18 49 18.0	3.474	11	7 15 23.01	2.3755	19 36 43.5	1.709
12	5 27 18.65	2.2116	18 52 43.7	3.381	12	7 17 45.62	2.3781	19 34 57.4	1.828
13	5 29 31.47	2.2157	18 56 3.7	3.286	13	7 20 8.38	2.3806	19 33 4.1	1.948
14	5 31 44.53	2.2197	18 59 18.0	3.191	14	7 22 31.29	2.3830	19 31 3.6	2.068
15	5 33 57.83	2.2237	19 2 26.6	3.095	15	7 24 54.34	2.3853	19 28 55.9	2.188
16	5 36 11.38	2.2278	19 5 29.4	2.998	16	7 27 17.53	2.3877	19 26 41.0	2.309
17	5 38 25.17	2.2318	19 8 26.4	2.901	17	7 29 40.86	2.3901	19 24 18.8	2.430
18	5 40 39.20	2.2358	19 11 17.5	2.803	18	7 32 4.34	2.3924	19 21 49.4	2.551
19	5 42 53.47	2.2398	19 14 2.7	2.704	19	7 34 27.95	2.3945	19 19 12.7	2.672
20	5 45 7.98	2.2437	19 16 42.0	2.606	20	7 36 51.68	2.3966	19 16 28.7	2.794
21	5 47 22.72	2.2477	19 19 15.4	2.506	21	7 39 15.54	2.3987	19 13 37.4	2.915
22	5 49 37.70	2.2516	19 21 42.7	2.405	22	7 41 39.53	2.4008	19 10 38.9	3.036
23	5 51 52.91	2.2555	19 24 4.0	2.304	23	7 44 3.64	2.4028	19 7 33.1	3.157
24	5 54 8.36	2.2594	N.19 26 19.2	2.202	24	7 46 27.86	2.4047	N.19 4 20.0	3.279

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 13.					**THURSDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 46 27.86	2.4047	N.19 4 20.0	3.279	0	9 43 6.27	2.4367	N.14 9 28.3	8.853
1	7 48 52.20	2.4066	19 0 59.6	3.401	1	9 45 32.46	2.4363	14 0 34.0	8.955
2	7 51 16.65	2.4084	18 57 31.9	3.523	2	9 47 58.62	2.4358	13 51 33.7	9.055
3	7 53 41.21	2.4101	18 53 56.8	3.646	3	9 50 24.76	2.4354	13 42 27.4	9.155
4	7 56 5.87	2.4118	18 50 14.4	3.767	4	9 52 50.87	2.4349	13 33 15.1	9.255
5	7 58 30.63	2.4135	18 46 24.7	3.889	5	9 55 16.95	2.4343	13 23 56.8	9.354
6	8 0 55.49	2.4151	18 42 27.7	4.011	6	9 57 42.99	2.4338	13 14 32.6	9.451
7	8 3 20.44	2.4166	18 38 23.4	4.133	7	10 0 9.00	2.4333	13 5 2.7	9.547
8	8 5 45.48	2.4182	18 34 11.8	4.255	8	10 2 34.98	2.4327	12 55 27.0	9.643
9	8 8 10.62	2.4197	18 29 52.8	4.377	9	10 5 0.92	2.4320	12 45 45.6	9.737
10	8 10 35.84	2.4210	18 25 26.5	4.499	10	10 7 26.82	2.4313	12 35 58.6	9.829
11	8 13 1.14	2.4223	18 20 52.9	4.620	11	10 9 52.68	2.4307	12 26 6.1	9.921
12	8 15 26.52	2.4236	18 16 12.1	4.741	12	10 12 18.51	2.4301	12 16 8.1	10.012
13	8 17 51.98	2.4248	18 11 24.0	4.862	13	10 14 44.29	2.4294	12 6 4.7	10.102
14	8 20 17.50	2.4259	18 6 28.6	4.984	14	10 17 10.03	2.4286	11 55 55.9	10.191
15	8 22 43.09	2.4270	18 1 25.9	5.105	15	10 19 35.72	2.4278	11 45 41.8	10.278
16	8 25 8.74	2.4281	17 56 16.0	5.225	16	10 22 1.37	2.4271	11 35 22.5	10.364
17	8 27 34.46	2.4292	17 50 58.9	5.346	17	10 24 26.97	2.4264	11 24 58.1	10.449
18	8 30 0.24	2.4301	17 45 34.5	5.467	18	10 26 52.53	2.4256	11 14 28.6	10.533
19	8 32 26.07	2.4310	17 40 2.9	5.587	19	10 29 18.04	2.4247	11 3 54.1	10.616
20	8 34 51.96	2.4319	17 34 24.1	5.706	20	10 31 43.49	2.4239	10 53 14.7	10.697
21	8 37 17.90	2.4327	17 28 38.2	5.825	21	10 34 8.90	2.4231	10 42 30.5	10.777
22	8 39 43.88	2.4334	17 22 45.1	5.944	22	10 36 34.26	2.4222	10 31 41.5	10.856
23	8 42 9.90	2.4341	N.17 16 44.9	6.062	23	10 38 59.57	2.4214	N.10 20 47.8	10.934
	WEDNESDAY 14					**FRIDAY 16.**			
0	8 44 35.97	2.4347	N.17 10 37.6	6.181	0	10 41 24.83	2.4206	N.10 9 49.4	11.011
1	8 47 2.07	2.4353	17 4 23.2	6.299	1	10 43 50.04	2.4197	9 58 46.4	11.086
2	8 49 28.20	2.4359	16 58 1.7	6.416	2	10 46 15.19	2.4187	9 47 39.1	11.158
3	8 51 54.37	2.4364	16 51 33.2	6.533	3	10 48 40.29	2.4178	9 36 27.5	11.229
4	8 54 20.57	2.4368	16 44 57.7	6.650	4	10 51 5.33	2.4169	9 25 11.6	11.301
5	8 56 46.79	2.4372	16 38 15.2	6.767	5	10 53 30.32	2.4161	9 13 51.4	11.372
6	8 59 13.03	2.4375	16 31 25.7	6.882	6	10 55 55.26	2.4152	9 2 27.0	11.441
7	9 1 39.29	2.4378	16 24 29.3	6.997	7	10 58 20.14	2.4142	8 50 58.5	11.507
8	9 4 5.57	2.4381	16 17 26.1	7.111	8	11 0 44.97	2.4133	8 39 26.2	11.570
9	9 6 31.87	2.4384	16 10 16.0	7.225	9	11 3 9.74	2.4124	8 27 50.1	11.633
10	9 8 58.18	2.4385	16 2 59.1	7.339	10	11 5 34.46	2.4116	8 16 10.2	11.696
11	9 11 24.49	2.4386	15 55 35.4	7.452	11	11 7 59.13	2.4107	8 4 26.5	11.758
12	9 13 50.81	2.4387	15 48 4.9	7.564	12	11 10 23.74	2.4098	7 52 39.2	11.817
13	9 16 17.14	2.4388	15 40 27.7	7.675	13	11 12 48.30	2.4088	7 40 48.4	11.875
14	9 18 43.47	2.4387	15 32 43.9	7.785	14	11 15 12.80	2.4079	7 28 54.2	11.932
15	9 21 9.79	2.4387	15 24 53.5	7.895	15	11 17 37.25	2.4071	7 16 56.6	11.987
16	9 23 36.11	2.4386	15 16 56.5	8.005	16	11 20 1.65	2.4062	7 4 55.8	12.040
17	9 26 2.42	2.4385	15 8 52.9	8.115	17	11 22 25.99	2.4053	6 52 51.8	12.092
18	9 28 28.73	2.4384	15 0 42.7	8.223	18	11 24 50.28	2.4044	6 40 44.7	12.142
19	9 30 55.03	2.4382	14 52 26.1	8.329	19	11 27 14.52	2.4035	6 28 34.7	12.191
20	9 33 21.31	2.4379	14 44 3.2	8.435	20	11 29 38.70	2.4026	6 16 21.8	12.238
21	9 35 47.58	2.4376	14 35 33.9	8.541	21	11 32 2.83	2.4017	6 4 6.1	12.284
22	9 38 13.83	2.4373	14 26 58.3	8.646	22	11 34 26.91	2.4009	5 51 47.7	12.328
23	9 40 40.06	2.4370	14 18 16.4	8.750	23	11 36 50.94	2.4001	5 39 26.7	12.371
24	9 43 6.27	2.4367	N.14 9 28.3	8.853	24	11 39 14.92	2.3992	N. 5 27 3.2	12.419

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 39 14.92	2.3992	N. 5 27 3.2	12.412
1	11 41 38.85	2.3984	5 14 37.3	12.451
2	11 44 2.73	2.3976	5 2 9.1	12.489
3	11 46 26.56	2.3968	4 49 38.6	12.526
4	11 48 50.35	2.3961	4 37 6.0	12.560
5	11 51 14.09	2.3953	4 24 31.4	12.593
6	11 53 37.78	2.3945	4 11 54.8	12.625
7	11 56 1.43	2.3938	3 59 16.4	12.654
8	11 58 25.04	2.3931	3 46 36.3	12.682
9	12 0 48.60	2.3924	3 33 54.5	12.709
10	12 3 12.12	2.3917	3 21 11.2	12.733
11	12 5 35.60	2.3910	3 8 26.5	12.757
12	12 7 59.04	2.3903	2 55 40.4	12.778
13	12 10 22.44	2.3897	2 42 53.1	12.798
14	12 12 45.80	2.3891	2 30 4.6	12.817
15	12 15 9.13	2.3885	2 17 15.1	12.833
16	12 17 32.42	2.3878	2 4 24.6	12.848
17	12 19 55.67	2.3872	1 51 33.3	12.862
18	12 22 18.89	2.3867	1 38 41.2	12.873
19	12 24 42.08	2.3862	1 25 48.5	12.883
20	12 27 5.24	2.3857	1 12 55.2	12.892
21	12 29 28.36	2.3852	1 0 1.5	12.898
22	12 31 51.46	2.3847	0 47 7.4	12.903
23	12 34 14.53	2.3842	N. 0 34 13.1	12.907

SUNDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 36 37.57	2.3838	N. 0 21 18.6	12.908
1	12 39 0.59	2.3834	N. 0 8 24.1	12.908
2	12 41 23.58	2.3830	S. 0 4 30.4	12.907
3	12 43 46.55	2.3827	0 17 24.8	12.904
4	12 46 9.50	2.3823	0 30 18.9	12.899
5	12 48 32.43	2.3820	0 43 12.7	12.892
6	12 50 55.34	2.3817	0 56 6.0	12.884
7	12 53 18.23	2.3814	1 8 58.8	12.874
8	12 55 41.10	2.3811	1 21 50.9	12.862
9	12 58 3.96	2.3809	1 34 42.3	12.850
10	13 0 26.81	2.3807	1 47 32.9	12.836
11	13 2 49.64	2.3804	2 0 22.6	12.819
12	13 5 12.46	2.3803	2 13 11.2	12.801
13	13 7 35.28	2.3801	2 25 58.7	12.782
14	13 9 58.08	2.3799	2 38 45.0	12.761
15	13 12 20.87	2.3798	2 51 30.0	12.737
16	13 14 43.65	2.3797	3 4 13.5	12.713
17	13 17 6.43	2.3797	3 16 55.6	12.688
18	13 19 29.21	2.3797	3 29 36.1	12.661
19	13 21 51.99	2.3796	3 42 14.9	12.632
20	13 24 14.76	2.3795	3 54 51.9	12.601
21	13 26 37.53	2.3795	4 7 27.0	12.568
22	13 29 0.30	2.3795	4 20 0.1	12.535
23	13 31 23.07	2.3796	4 32 31.2	12.500
24	13 33 45.85	2.3797	S. 4 45 0.1	12.463

MONDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 33 45.85	2.3797	S. 4 45 0.1	12.463
1	13 36 8.63	2.3798	4 57 26.8	12.425
2	13 38 31.42	2.3798	5 9 51.1	12.385
3	13 40 54.21	2.3799	5 22 13.0	12.344
4	13 43 17.01	2.3801	5 34 32.4	12.302
5	13 45 39.82	2.3802	5 46 49.2	12.257
6	13 48 2.63	2.3803	5 59 3.2	12.210
7	13 50 25.45	2.3805	6 11 14.4	12.163
8	13 52 48.29	2.3807	6 23 22.8	12.116
9	13 55 11.14	2.3809	6 35 28.3	12.066
10	13 57 34.00	2.3811	6 47 30.7	12.014
11	13 59 56.87	2.3813	6 59 30.0	11.961
12	14 2 19.76	2.3816	7 11 26.0	11.906
13	14 4 42.66	2.3819	7 23 18.7	11.851
14	14 7 5.58	2.3822	7 35 8.1	11.794
15	14 9 28.52	2.3825	7 46 54.0	11.736
16	14 11 51.48	2.3827	7 58 36.4	11.676
17	14 14 14.45	2.3830	8 10 15.1	11.614
18	14 16 37.44	2.3833	8 21 50.1	11.552
19	14 19 0.45	2.3837	8 33 21.3	11.488
20	14 21 23.48	2.3841	8 44 48.7	11.424
21	14 23 46.54	2.3844	8 56 12.2	11.357
22	14 26 9.61	2.3847	9 7 31.6	11.289
23	14 28 32.70	2.3851	S. 9 18 46.9	11.221

TUESDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 30 55.82	2.3855	S. 9 29 58.1	11.151
1	14 33 18.96	2.3858	9 41 5.0	11.079
2	14 35 42.12	2.3862	9 52 7.6	11.007
3	14 38 5.30	2.3865	10 3 5.8	10.933
4	14 40 28.50	2.3869	10 13 59.5	10.858
5	14 42 51.73	2.3873	10 24 48.7	10.782
6	14 45 14.98	2.3877	10 35 33.3	10.704
7	14 47 38.25	2.3881	10 46 13.2	10.626
8	14 50 1.55	2.3885	10 56 48.4	10.546
9	14 52 24.87	2.3889	11 7 18.7	10.464
10	14 54 48.22	2.3893	11 17 44.1	10.383
11	14 57 11.59	2.3897	11 28 4.6	10.301
12	14 59 34.98	2.3900	11 38 20.2	10.218
13	15 1 58.39	2.3904	11 48 30.7	10.132
14	15 4 21.83	2.3908	11 58 36.0	10.045
15	15 6 45.29	2.3912	12 8 36.1	9.957
16	15 9 8.77	2.3915	12 18 30.9	9.869
17	15 11 32.27	2.3919	12 28 20.4	9.781
18	15 13 55.80	2.3923	12 38 4.6	9.691
19	15 16 19.35	2.3927	12 47 43.3	9.599
20	15 18 42.92	2.3930	12 57 16.5	9.507
21	15 21 6.51	2.3932	13 6 44.2	9.415
22	15 23 30.11	2.3935	13 16 6.3	9.321
23	15 25 53.73	2.3938	13 25 22.7	9.226
24	15 28 17.37	2.3942	S. 13 34 33.4	9.131

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 21.					**FRIDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 28 17.37	2.3942	S. 13 34 33.4	9.131	0	17 23 6.92	2.3783	S. 18 50 2.6	3.841
1	15 30 41.03	2.3945	13 43 38.4	9.034	1	17 25 29.58	2.3771	18 53 49.5	3.723
2	15 33 4.71	2.3947	13 52 37.5	8.936	2	17 27 52.17	2.3758	18 57 29.3	3.604
3	15 35 28.40	2.3949	14 1 30.7	8.837	3	17 30 14.68	2.3745	19 1 2.0	3.486
4	15 37 52.10	2.3952	14 10 18.0	8.739	4	17 32 37.11	2.3732	19 4 27.6	3.368
5	15 40 15.82	2.3954	14 18 59.4	8.640	5	17 34 59.46	2.3718	19 7 46.2	3.251
6	15 42 39.55	2.3956	14 27 34.8	8.540	6	17 37 21.73	2.3704	19 10 57.7	3.132
7	15 45 3.29	2.3957	14 36 4.2	8.438	7	17 39 43.91	2.3689	19 14 2.1	3.014
8	15 47 27.04	2.3959	14 44 27.4	8.336	8	17 42 6.00	2.3674	19 16 59.4	2.897
9	15 49 50.80	2.3961	14 52 44.5	8.233	9	17 44 28.00	2.3658	19 19 49.7	2.779
10	15 52 14.57	2.3962	15 0 55.4	8.129	10	17 46 49.90	2.3642	19 22 32.9	2.661
11	15 54 38.34	2.3963	15 9 0.0	8.025	11	17 49 11.70	2.3626	19 25 9.0	2.543
12	15 57 2.12	2.3963	15 16 58.4	7.921	12	17 51 33.41	2.3609	19 27 38.1	2.426
13	15 59 25.90	2.3963	15 24 50.5	7.815	13	17 53 55.01	2.3592	19 30 0.1	2.308
14	16 1 49.68	2.3964	15 32 36.2	7.708	14	17 56 16.51	2.3574	19 32 15.1	2.191
15	16 4 13.47	2.3965	15 40 15.5	7.602	15	17 58 37.90	2.3556	19 34 23.0	2.073
16	16 6 37.26	2.3964	15 47 48.4	7.495	16	18 0 59.18	2.3537	19 36 23.9	1.957
17	16 9 1.04	2.3963	15 55 14.9	7.387	17	18 3 20.34	2.3517	19 38 17.8	1.839
18	16 11 24.82	2.3962	16 2 34.9	7.278	18	18 5 41.39	2.3498	19 40 4.6	1.723
19	16 13 48.59	2.3962	16 9 48.3	7.169	19	18 8 2.32	2.3478	19 41 44.5	1.607
20	16 16 12.36	2.3961	16 16 55.2	7.060	20	18 10 23.13	2.3457	19 43 17.4	1.490
21	16 18 36.12	2.3959	16 23 55.5	6.950	21	18 12 43.81	2.3437	19 44 43.3	1.374
22	16 20 59.87	2.3957	16 30 49.2	6.839	22	18 15 4.37	2.3416	19 46 2.3	1.258
23	16 23 23.61	2.3955	S. 16 37 36.2	6.727	23	18 17 24.80	2.3394	S. 19 47 14.3	1.142
	THURSDAY 22.					**SATURDAY 24.**			
0	16 25 47.33	2.3952	S. 16 44 16.5	6.616	0	18 19 45.10	2.3372	S. 19 48 19.4	1.027
1	16 28 11.03	2.3949	16 50 50.1	6.504	1	18 22 5.26	2.3349	19 49 17.6	0.912
2	16 30 34.72	2.3946	16 57 17.0	6.391	2	18 24 25.29	2.3326	19 50 8.9	0.797
3	16 32 58.39	2.3943	17 3 37.1	6.278	3	18 26 45.18	2.3303	19 50 53.3	0.683
4	16 35 22.04	2.3939	17 9 50.4	6.165	4	18 29 4.93	2.3280	19 51 30.9	0.569
5	16 37 45.66	2.3934	17 15 56.9	6.052	5	18 31 24.54	2.3256	19 52 1.6	0.455
6	16 40 9.25	2.3930	17 21 56.6	5.938	6	18 33 44.00	2.3231	19 52 25.5	0.342
7	16 42 32.82	2.3925	17 27 49.4	5.823	7	18 36 3.31	2.3206	19 52 42.6	0.229
8	16 44 56.35	2.3919	17 33 35.3	5.708	8	18 38 22.47	2.3181	19 52 52.9	0.116
9	16 47 19.85	2.3914	17 39 14.4	5.594	9	18 40 41.48	2.3155	19 52 56.5	−0.003
10	16 49 43.32	2.3908	17 44 46.6	5.478	10	18 43 0.33	2.3129	19 52 53.3	+0.109
11	16 52 6.75	2.3902	17 50 11.8	5.362	11	18 45 19.03	2.3103	19 52 43.4	0.221
12	16 54 30.14	2.3895	17 55 30.0	5.246	12	18 47 37.57	2.3076	19 52 26.8	0.332
13	16 56 53.49	2.3888	18 0 41.3	5.130	13	18 49 55.94	2.3048	19 52 3.5	0.443
14	16 59 16.80	2.3881	18 5 45.6	5.013	14	18 52 14.15	2.3021	19 51 33.6	0.553
15	17 1 40.06	2.3873	18 10 42.9	4.897	15	18 54 32.19	2.2993	19 50 57.1	0.663
16	17 4 3.27	2.3864	18 15 33.3	4.781	16	18 56 50.07	2.2965	19 50 14.0	0.773
17	17 6 26.43	2.3856	18 20 16.6	4.664	17	18 59 7.77	2.2936	19 49 24.3	0.882
18	17 8 49.54	2.3847	18 24 52.9	4.546	18	19 1 25.30	2.2907	19 48 28.1	0.991
19	17 11 12.60	2.3837	18 29 22.1	4.429	19	19 3 42.66	2.2878	19 47 25.4	1.099
20	17 13 35.59	2.3827	18 33 44.3	4.312	20	19 5 59.84	2.2848	19 46 16.2	1.207
21	17 15 58.52	2.3817	18 37 59.5	4.194	21	19 8 16.84	2.2818	19 45 0.5	1.315
22	17 18 21.39	2.3806	18 42 7.6	4.076	22	19 10 33.66	2.2788	19 43 38.4	1.422
23	17 20 44.19	2.3794	18 46 8.6	3.958	23	19 12 50.30	2.2757	19 42 9.9	1.528
24	17 23 6.92	2.3783	S. 18 50 2.6	3.841	24	19 15 6.75	2.2727	S. 19 40 35.1	1.633

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 25.					**TUESDAY 27.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 15 6.75	2.2727	S. 19 40 35.1	1.633	0	21 0 15.45	2.1042	S. 16 31 18.4	6.007
1	19 17 23.02	2.2696	19 38 53.9	1.739	1	21 2 21.59	2.1006	16 25 15.7	6.082
2	19 19 39.10	2.2664	19 37 6.4	1.843	2	21 4 27.52	2.0970	16 19 8.6	6.155
3	19 21 54.99	2.2632	19 35 12.7	1.948	3	21 6 33.23	2.0934	16 12 57.1	6.228
4	19 24 10.69	2.2601	19 33 12.7	2.052	4	21 8 38.73	2.0898	16 6 41.2	6.301
5	19 26 26.20	2.2569	19 31 6.5	2.155	5	21 10 44.01	2.0862	16 0 21.0	6.373
6	19 28 41.51	2.2536	19 28 54.1	2.257	6	21 12 49.07	2.0826	15 53 56.4	6.445
7	19 30 56.63	2.2503	19 26 35.6	2.359	7	21 14 53.92	2.0791	15 47 27.6	6.515
8	19 33 11.55	2.2470	19 24 11.0	2.461	8	24 16 58.56	2.0755	15 40 54.6	6.585
9	19 35 26.27	2.2437	19 21 40.3	2.562	9	21 19 2.98	2.0719	15 34 17.4	6.654
10	19 37 40.79	2.2403	19 19 3.5	2.663	10	21 21 7.19	2.0684	15 27 36.1	6.722
11	19 39 55.11	2.2370	19 16 20.7	2.763	11	21 23 11.19	2.0649	15 20 50.7	6.790
12	19 42 9.23	2.2336	19 13 31.9	2.863	12	21 25 14.98	2.0614	15 14 1.3	6.857
13	19 44 23.14	2.2302	19 10 37.2	2.961	13	21 27 18.56	2.0579	15 7 7.9	6.923
14	19 46 36.85	2.2267	19 7 36.6	3.058	14	21 29 21.93	2.0545	15 0 10.5	6.989
15	19 48 50.35	2.2232	19 4 30.2	3.156	15	21 31 25.10	2.0511	14 53 9.2	7.053
16	19 51 3.64	2.2198	19 1 17.9	3.253	16	21 33 28.06	2.0476	14 46 4.1	7.117
17	19 53 16.73	2.2164	18 57 59.8	3.349	17	21 35 30.81	2.0442	14 38 55.1	7.181
18	19 55 29.61	2.2129	18 54 36.0	3.444	18	21 37 33.36	2.0408	14 31 42.3	7.244
19	19 57 42.28	2.2093	18 51 6.5	3.539	19	21 39 35.71	2.0375	14 24 25.8	7.306
20	19 59 54.73	2.2057	18 47 31.3	3.633	20	21 41 37.86	2.0341	14 17 5.6	7.367
21	20 2 6.97	2.2022	18 43 50.5	3.728	21	21 43 39.80	2.0307	14 9 41.7	7.428
22	20 4 19.00	2.1987	18 40 4.0	3.822	22	21 45 41.54	2.0274	14 2 14.2	7.488
23	20 6 30.82	2.1952	S. 18 36 11.9	3.914	23	21 47 43.09	2.0242	S. 13 54 43.2	7.547
	MONDAY 26.					**WEDNESDAY 28.**			
0	20 8 42.42	2.1916	S. 18 32 14.3	4.005	0	21 49 44.44	2.0209	S. 13 47 8.6	7.606
1	20 10 53.81	2.1880	18 28 11.3	4.096	1	21 51 45.60	2.0177	13 39 30.5	7.663
2	20 13 4.98	2.1843	18 24 2.8	4.187	2	21 53 46.56	2.0144	13 31 49.0	7.720
3	20 15 15.93	2.1807	18 19 48.9	4.277	3	21 55 47.32	2.0111	13 24 4.1	7.777
4	20 17 26.67	2.1772	18 15 29.6	4.366	4	21 57 47.89	2.0080	13 16 15.8	7.832
5	20 19 37.19	2.1735	18 11 5.0	4.454	5	21 59 48.28	2.0049	13 8 24.2	7.887
6	20 21 47.49	2.1698	18 6 35.1	4.542	6	22 1 48.48	2.0017	13 0 29.3	7.942
7	20 23 57.57	2.1662	18 2 0.0	4.629	7	22 3 48.49	1.9986	12 52 31.2	7.995
8	20 26 7.43	2.1625	17 57 19.6	4.716	8	22 5 48.31	1.9955	12 44 29.9	8.048
9	20 28 17.07	2.1589	17 52 34.0	4.802	9	22 7 47.95	1.9925	12 36 25.4	8.101
10	20 30 26.50	2.1553	17 47 43.3	4.887	10	22 9 47.41	1.9894	12 28 17.8	8.152
11	20 32 35.71	2.1517	17 42 47.6	4.971	11	22 11 46.68	1.9863	12 20 7.2	8.202
12	20 34 44.70	2.1480	17 37 46.8	5.055	12	22 13 45.77	1.9833	12 11 53.6	8.251
13	20 36 53.47	2.1443	17 32 41.0	5.138	13	22 15 44.68	1.9804	12 3 37.1	8.300
14	20 39 2.02	2.1407	17 27 30.2	5.221	14	22 17 43.42	1.9776	11 55 17.6	8.350
15	20 41 10.35	2.1370	17 22 14.5	5.302	15	22 19 41.99	1.9747	11 46 55.1	8.399
16	20 43 18.46	2.1333	17 16 53.9	5.383	16	22 21 40.39	1.9718	11 38 29.7	8.447
17	20 45 26.35	2.1297	17 11 28.5	5.463	17	22 23 38.61	1.9689	11 30 1.5	8.493
18	20 47 34.02	2.1260	17 5 58.3	5.543	18	22 25 36.66	1.9661	11 21 30.6	8.538
19	20 49 41.47	2.1224	17 0 23.3	5.622	19	22 27 34.54	1.9633	11 12 57.0	8.583
20	20 51 48.71	2.1187	16 54 43.6	5.701	20	22 29 32.26	1.9606	11 4 20.7	8.628
21	20 53 55.72	2.1150	16 48 59.2	5.778	21	22 31 29.81	1.9578	10 55 41.7	8.672
22	20 56 2.51	2.1114	16 43 10.2	5.855	22	22 33 27.20	1.9551	10 47 0.1	8.714
23	20 58 9.09	2.1078	16 37 16.6	5.932	23	22 35 24.43	1.9525	10 38 16.0	8.757
24	21 0 15.45	2.1042	S. 16 31 18.4	6.007	24	22 37 21.50	1.9499	S. 10 29 29.3	8.799

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 37 21.50	1.9499	S. 10 29 29.3	8.799
1	22 39 18.42	1.9473	10 20 40.1	8.840
2	22 41 15.18	1.9447	10 11 48.5	8.880
3	22 43 11.78	1.9421	10 2 54.5	8.920
4	22 45 8.23	1.9396	9 53 58.1	8.959
5	22 47 4.54	1.9372	9 44 59.4	8.997
6	22 49 0.70	1.9347	9 35 58.5	9.034
7	22 50 56.71	1.9323	9 26 55.3	9.071
8	22 52 52.58	1.9300	9 17 49.9	9.108
9	22 54 48.31	1.9277	9 8 42.3	9.144
10	22 56 43.90	1.9254	8 59 32.6	9.178
11	22 58 39.35	1.9231	8 50 20.9	9.212
12	23 0 34.67	1.9208	8 41 7.1	9.246
13	23 2 29.85	1.9186	8 31 51.3	9.279
14	23 4 24.90	1.9165	8 22 33.6	9.312
15	23 6 19.83	1.9144	8 13 13.9	9.344
16	23 8 14.63	1.9122	8 3 52.3	9.375
17	23 10 9.30	1.9102	7 54 28.9	9.405
18	23 12 3.85	1.9082	7 45 3.7	9.435
19	23 13 58.28	1.9062	7 35 36.7	9.464
20	23 15 52.59	1.9042	7 26 8.0	9.492
21	23 17 46.79	1.9023	7 16 37.7	9.519
22	23 19 40.87	1.9004	7 7 5.8	9.546
23	23 21 34.84	1.8986	S. 6 57 32.2	9.573

FRIDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 23 28.70	1.8968	S. 6 47 57.0	9.599
1	23 25 22.46	1.8951	6 38 20.3	9.623
2	23 27 16.11	1.8933	6 28 42.2	9.647
3	23 29 9.65	1.8915	6 19 2.6	9.671
4	23 31 3.09	1.8899	6 9 21.6	9.695
5	23 32 56.44	1.8883	5 59 39.2	9.717
6	23 34 49.69	1.8867	5 49 55.5	9.739
7	23 36 42.85	1.8852	5 40 10.5	9.760
8	23 38 35.92	1.8837	5 30 24.3	9.781
9	23 40 28.89	1.8822	5 20 36.8	9.801
10	23 42 21.78	1.8807	5 10 48.2	9.820
11	23 44 14.58	1.8793	5 0 58.4	9.839
12	23 46 7.30	1.8780	4 51 7.5	9.857
13	23 47 59.94	1.8767	4 41 15.5	9.875
14	23 49 52.50	1.8754	4 31 22.5	9.891
15	23 51 44.99	1.8742	4 21 28.6	9.906
16	23 53 37.41	1.8731	4 11 33.8	9.921
17	23 55 29.76	1.8719	4 1 38.1	9.936
18	23 57 22.03	1.8707	3 51 41.5	9.950
19	23 59 14.24	1.8696	3 41 44.1	9.964
20	0 1 6.39	1.8686	3 31 45.9	9.977
21	0 2 58.47	1.8675	3 21 46.9	9.989
22	0 4 50.49	1.8666	3 11 47.2	10.001
23	0 6 42.46	1.8657	3 1 46.8	10.012
24	0 8 34.37	1.8647	S. 2 51 45.8	10.022

SATURDAY, OCTOBER 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 8 34.37	1.8647	S. 2 51 45.8	10.022

PHASES OF THE MOON.

		d	h	m
○ Full Moon . .	Sept.	1	23	12.6
☾ Last Quarter		10	3	3.2
● New Moon		17	1	59.8
☽ First Quarter . . .		23	17	3.8

		d	h
☾ Apogee	Sept.	5	3.3
☾ Perigee		17	18.7

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Antares	W.	79° 42′ 14″	2997	81° 12′ 30″	3003	82° 42′ 39″	3009	84° 12′ 40″	3015
	α Aquilæ	W.	40 6 54	4452	41 11 29	4366	42 17 21	4291	43 24 22	4222
	α Arietis	E.	68 39 53	3114	67 12 0	3124	65 44 20	3135	64 16 53	3146
	Aldebaran	E.	100 9 41	2935	98 38 7	2942	97 6 41	2949	95 35 24	2955
2	Antares	W.	91 40 56	3045	93 10 13	3051	94 39 23	3056	96 8 26	3063
	α Aquilæ	W.	49 13 35	3972	50 25 42	3935	51 38 26	3902	52 51 44	3872
	α Arietis	E.	57 3 7	3209	55 37 8	3222	54 11 25	3236	52 45 59	3251
	Aldebaran	E.	88 0 55	2985	86 30 24	2991	85 0 0	2996	83 29 42	3001
3	α Aquilæ	W.	59 5 1	3759	60 20 46	3742	61 36 49	3726	62 53 9	3711
	α Arietis	E.	45 43 34	3341	44 20 10	3363	42 57 11	3387	41 34 40	3413
	Aldebaran	E.	75 59 52	3027	74 30 13	3031	73 0 39	3035	71 31 10	3039
4	α Aquilæ	W.	69 18 5	3659	70 35 36	3651	71 53 15	3644	73 11 2	3638
	Fomalhaut	W.	35 20 4	3940	36 32 43	3883	37 46 20	3833	39 0 48	3788
	Aldebaran	E.	64 5 0	3058	62 35 59	3061	61 7 2	3064	59 38 8	3066
	Pollux	E.	108 1 31	3118	106 33 43	3119	105 5 57	3121	103 38 13	3124
5	α Aquilæ	W.	79 41 25	3613	80 59 45	3610	82 18 8	3609	83 36 33	3607
	Fomalhaut	W.	45 23 31	3620	46 41 44	3596	48 0 23	3573	49 19 27	3552
	α Pegasi	W.	33 25 15	4404	34 30 33	4308	35 37 18	4222	36 45 23	4146
	Aldebaran	E.	52 14 21	3077	50 45 43	3077	49 17 5	3078	47 48 28	3078
	Pollux	E.	96 20 7	3130	94 52 34	3131	93 25 2	3132	91 57 31	3133
6	Fomalhaut	W.	56 0 2	3467	57 21 3	3453	58 42 20	3438	60 3 53	3426
	α Pegasi	W.	42 42 1	3861	43 56 0	3820	45 10 42	3780	46 26 5	3745
	Aldebaran	E.	40 25 28	3077	38 56 50	3075	37 28 10	3073	35 59 28	3072
	Pollux	E.	84 40 0	3131	83 12 28	3130	81 44 55	3129	80 17 20	3127
	SATURN	E.	94 32 4	3118	93 4 16	3116	91 36 26	3114	90 8 34	3113
	MARS	E.	99 1 4	3318	97 37 13	3316	96 13 20	3314	94 49 25	3312
7	Fomalhaut	W.	66 55 2	3369	68 17 54	3358	69 40 58	3347	71 4 15	3337
	α Pegasi	W.	52 51 38	3598	54 10 15	3574	55 29 18	3551	56 48 46	3529
	Aldebaran	E.	28 35 15	3056	27 6 12	3052	25 37 4	3047	24 7 50	3043
	Pollux	E.	72 58 50	3115	71 30 59	3112	70 3 4	3109	68 35 5	3105
	SATURN	E.	82 48 28	3096	81 20 14	3092	79 51 55	3087	78 23 30	3082
	MARS	E.	87 49 1	3295	86 24 44	3290	85 0 21	3285	83 35 52	3280
	SUN	E.	124 50 50	3429	123 29 6	3424	122 7 17	3419	120 45 22	3415
8	Fomalhaut	W.	78 3 37	3286	79 28 5	3276	80 52 44	3265	82 17 36	3255
	α Pegasi	W.	63 31 52	3432	64 53 32	3414	66 15 33	3396	67 37 54	3379
	Pollux	E.	61 13 52	3082	59 45 20	3077	58 16 42	3071	56 47 57	3065
	SATURN	E.	70 59 42	3051	69 30 32	3043	68 1 12	3035	66 31 43	3026
	MARS	E.	76 31 44	3247	75 6 30	3239	73 41 7	3231	72 15 34	3221
	SUN	E.	113 54 6	3379	112 31 26	3372	111 8 37	3363	109 45 38	3354
9	Fomalhaut	W.	89 24 59	3203	90 51 5	3192	92 17 24	3182	93 43 55	3171
	α Pegasi	W.	74 34 25	3299	75 58 38	3282	77 23 10	3267	78 48 0	3252
	α Arietis	W.	31 15 2	3538	32 34 44	3480	33 55 31	3426	35 17 18	3378
	Pollux	E.	49 22 23	3035	47 52 54	3029	46 23 17	3023	44 53 33	3017
	SATURN	E.	59 1 28	2978	57 30 48	2967	55 59 54	2956	54 28 46	2944

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
1	Antares	W.	85° 42′ 34″	3021	87° 12′ 21″	3027	88° 42′ 0″	3033	90° 11′ 32″	3039
	α Aquilæ	W.	44 32 27	4161	45 41 30	4107	46 51 25	4058	48 2 8	4013
	α Arietis	E.	62 49 39	3158	61 22 39	3169	59 55 53	3182	58 29 22	3195
	Aldebaran	E.	94 4 15	2962	92 33 14	2967	91 2 20	2973	89 31 34	2979
2	Antares	W.	97 37 21	3069	99 6 9	3074	100 34 50	3079	102 3 25	3084
	α Aquilæ	W.	54 5 32	3845	55 19 48	3820	56 34 30	3797	57 49 35	3777
	α Arietis	E.	51 20 50	3267	49 56 0	3284	48 31 30	3302	47 7 21	3321
	Aldebaran	E.	81 59 31	3007	80 29 27	3012	78 59 29	3017	77 29 37	3022
3	α Aquilæ	W.	64 9 44	3699	65 26 32	3688	66 43 32	3677	68 0 43	3667
	α Arietis	E.	40 12 38	3440	38 51 7	3470	37 30 9	3503	36 9 48	3541
	Aldebaran	E.	70 1 46	3043	68 32 27	3047	67 3 13	3052	65 34 4	3056
4	α Aquilæ	W.	74 28 55	3632	75 46 55	3627	77 5 0	3623	78 23 10	3618
	Fomalhaut	W.	40 16 3	3746	41 32 1	3710	42 48 37	3677	44 5 48	3648
	Aldebaran	E.	58 9 17	3069	56 40 29	3071	55 11 44	3073	53 43 1	3075
	Pollux	E.	102 10 32	3125	100 42 53	3127	99 15 16	3129	97 47 41	3129
5	α Aquilæ	W.	84 55 0	3604	86 13 30	3602	87 32 2	3600	88 50 36	3598
	Fomalhaut	W.	50 38 54	3533	51 58 42	3515	53 18 50	3497	54 39 17	3481
	α Pegasi	W.	37 54 40	4077	39 5 4	4015	40 16 29	3959	41 28 49	3908
	Aldebaran	E.	46 19 52	3078	44 51 16	3078	43 22 40	3078	41 54 4	3078
	Pollux	E.	90 30 1	3133	89 2 31	3133	87 35 1	3133	86 7 31	3132
6	Fomalhaut	W.	61 25 40	3414	62 47 41	3402	64 9 55	3391	65 32 22	3379
	α Pegasi	W.	47 42 5	3711	48 58 40	3680	50 15 48	3650	51 33 28	3623
	Aldebaran	E.	34 30 44	3069	33 1 57	3067	31 33 7	3064	30 4 13	3060
	Pollux	E.	78 49 43	3124	77 22 3	3123	75 54 21	3121	74 26 37	3119
	Saturn	E.	88 40 40	3110	87 12 43	3107	85 44 42	3104	84 16 37	3101
	Mars	E.	93 25 27	3309	92 1 26	3306	90 37 22	3303	89 13 14	3299
7	Fomalhaut	W.	72 27 44	3326	73 51 25	3317	75 15 17	3306	76 39 21	3296
	α Pegasi	W.	58 8 38	3507	59 28 54	3488	60 49 32	3468	62 10 32	3450
	Aldebaran	E.	22 38 30	3038	21 9 4	3032	19 39 31	3026	18 9 50	3019
	Pollux	E.	67 7 1	3101	65 38 52	3096	64 10 38	3091	62 42 18	3087
	Saturn	E.	76 54 59	3077	75 26 21	3071	73 57 36	3065	72 28 43	3058
	Mars	E.	82 11 17	3274	80 46 35	3268	79 21 46	3261	77 56 49	3254
	Sun	E.	119 23 22	3408	118 1 15	3401	116 39 0	3394	115 16 37	3387
8	Fomalhaut	W.	83 42 40	3245	85 7 56	3234	86 33 25	3224	87 59 6	3214
	α Pegasi	W.	69 0 35	3362	70 23 35	3346	71 46 53	3330	73 10 30	3314
	Pollux	E.	55 19 5	3060	53 50 6	3053	52 20 59	3047	50 51 45	3041
	Saturn	E.	65 2 3	3018	63 32 12	3009	62 2 10	2998	60 31 55	2989
	Mars	E.	70 49 50	3212	69 23 55	3203	67 57 49	3192	66 31 30	3182
	Sun	E.	108 22 29	3345	106 59 9	3334	105 35 37	3324	104 11 53	3313
9	Fomalhaut	W.	95 10 39	3160	96 37 36	3149	98 4 46	3138	99 32 10	3127
	α Pegasi	W.	80 13 8	3236	81 38 34	3221	83 4 18	3206	84 30 20	3191
	α Arietis	W.	36 40 0	3332	38 3 34	3290	39 27 57	3251	40 53 6	3214
	Pollux	E.	43 23 41	3011	41 53 42	3006	40 23 37	3001	38 53 26	2998
	Saturn	E.	52 57 23	2931	51 25 44	2920	49 53 50	2907	48 21 40	2893

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LUNAR DISTANCES.

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9	**Mars**	E.	65° 4′ 59″	3171	63° 38′ 15″	3159	62° 11′ 17″	3147	60° 44′ 4″	3135
	Sun	E.	102 47 57	3302	101 23 48	3290	99 59 25	3277	98 34 47	3265
10	α Arietis	W.	42 18 58	3180	43 45 31	3147	45 12 44	3115	46 40 35	3085
	Pollux	E.	37 23 11	2995	35 52 52	2993	34 22 30	2993	32 52 8	2993
	Saturn	E.	46 49 12	2879	45 16 26	2865	43 43 22	2851	42 10 0	2837
	Mars	E.	53 24 8	3067	51 55 18	3052	50 26 10	3038	48 56 44	3022
	Regulus	E.	72 23 46	2839	70 50 9	2825	69 16 14	2811	67 42 1	2797
	Sun	E.	91 27 46	3195	90 1 31	3180	88 34 58	3165	87 8 7	3148
11	α Arietis	W.	54 8 43	2947	55 40 2	2922	57 11 53	2898	58 44 15	2873
	Aldebaran	W.	20 22 47	2719	21 59 2	2701	23 35 40	2684	25 12 41	2667
	Saturn	E.	34 18 16	2758	32 42 53	2741	31 7 8	2725	29 31 1	2707
	Mars	E.	41 24 32	2939	39 53 3	2922	38 21 12	2905	36 48 59	2887
	Regulus	E.	59 45 54	2717	58 9 37	2701	56 32 58	2684	54 55 56	2666
	Sun	E.	79 48 51	3064	78 19 57	3046	76 50 41	3027	75 21 2	3009
12	α Arietis	W.	66 33 51	2755	68 9 18	2733	69 45 14	2710	71 21 40	2688
	Aldebaran	W.	33 23 44	2577	35 3 11	2559	36 43 3	2540	38 23 21	2520
	Mars	E.	29 2 5	2795	27 27 31	2776	25 52 32	2758	24 17 9	2741
	Regulus	E.	46 44 47	2576	45 5 19	2558	43 25 26	2539	41 45 7	2521
	Sun	E.	67 46 54	2912	66 14 51	2893	64 42 23	2873	63 9 30	2854
13	α Arietis	W.	79 31 9	2582	81 10 29	2561	82 50 17	2542	84 30 32	2522
	Aldebaran	W.	46 51 29	2426	48 34 27	2408	50 17 51	2389	52 1 42	2370
	Regulus	E.	33 17 0	2426	31 34 2	2408	29 50 38	2389	28 6 47	2370
	Sun	E.	55 18 37	2753	53 43 8	2734	52 7 13	2713	50 30 51	2694
14	α Arietis	W.	92 58 28	2431	94 41 19	2414	96 24 34	2398	98 8 12	2382
	Aldebaran	W.	60 47 40	2278	62 34 12	2261	64 21 9	2244	66 8 31	2227
	Sun	E.	42 22 34	2600	40 43 39	2583	39 4 20	2565	37 24 37	2548
15	Aldebaran	W.	75 11 30	2148	77 1 16	2134	78 51 24	2120	80 41 53	2107
	Pollux	W.	32 10 25	2335	33 55 33	2304	35 41 27	2275	37 28 3	2249
	Sun	E.	29 0 27	2475	27 18 38	2462	25 36 32	2451	23 54 10	2442
19	**Sun**	W.	27 36 44	2341	29 21 44	2347	31 6 35	2355	32 51 15	2363
	Antares	E.	45 38 7	2143	43 48 14	2161	41 58 47	2179	40 9 48	2200
	α Aquilæ	E.	93 33 6	2548	91 53 0	2555	90 13 3	2564	88 33 18	2574
20	**Sun**	W.	41 31 16	2416	43 14 28	2428	44 57 23	2441	46 39 59	2455
	Spica	W.	17 40 36	2419	19 23 43	2378	21 7 49	2350	22 52 35	2333
	α Aquilæ	E.	80 18 47	2649	78 40 58	2669	77 3 36	2690	75 26 43	2713
21	**Sun**	W.	55 7 51	2531	56 48 21	2548	58 28 28	2564	60 8 13	2581
	Spica	W.	31 40 1	2321	33 25 30	2326	35 10 51	2334	36 56 1	2343
	Jupiter	W.	17 30 17	2391	19 14 5	2387	20 57 59	2388	22 41 51	2392
	α Aquilæ	E.	67 30 36	2853	65 57 17	2887	64 24 41	2922	62 52 50	2960
	Fomalhaut	E.	100 22 15	2489	98 40 46	2501	96 59 34	2515	95 18 41	2529
22	**Sun**	W.	68 21 4	2668	69 58 27	2686	71 35 26	2704	73 12 1	2722
	Spica	W.	45 38 8	2402	47 21 40	2415	49 4 53	2429	50 47 47	2443

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9	Mars	E.	59° 16′ 37″	3123	57° 48′ 55″	3109	56° 20′ 56″	3096	54° 52′ 41″	3081
	Sun	E.	97 9 54	3252	95 44 46	3239	94 19 23	3225	92 53 43	3210
10	α Arietis	W.	48 9 3	3056	49 38 7	3028	51 7 45	3001	52 37 57	2973
	Pollux	E.	31 21 47	2997	29 51 31	3004	28 21 23	3014	26 51 27	3028
	Saturn	E.	40 36 20	2821	39 2 20	2805	37 27 59	2790	35 53 18	2774
	Mars	E.	47 26 58	3005	45 56 52	2989	44 26 26	2973	42 55 39	2957
	Regulus	E.	66 7 29	2782	64 32 37	2766	62 57 24	2750	61 21 50	2733
	Sun	E.	85 40 56	3132	84 13 25	3115	82 45 34	3099	81 17 23	3082
11	α Arietis	W.	60 17 8	2848	61 50 33	2825	63 24 28	2801	64 58 54	2778
	Aldebaran	W.	26 50 5	2649	28 27 53	2632	30 6 5	2613	31 44 42	2595
	Saturn	E.	27 54 31	2691	26 17 39	2674	24 40 24	2657	23 2 47	2640
	Mars	E.	35 16 23	2869	33 43 24	2850	32 10 1	2832	30 36 15	2814
	Regulus	E.	53 18 30	2649	51 40 41	2631	50 2 28	2612	48 23 50	2594
	Sun	E.	73 51 0	2989	72 20 34	2971	70 49 45	2952	69 18 32	2932
12	α Arietis	W.	72 58 36	2666	74 36 1	2645	76 13 55	2624	77 52 18	2603
	Aldebaran	W.	40 4 6	2502	41 45 17	2483	43 26 54	2464	45 8 58	2445
	Mars	E.	22 41 23	2722	21 5 13	2704	19 28 39	2688	17 51 43	2672
	Regulus	E.	40 4 23	2502	38 23 12	2483	36 41 35	2464	34 59 31	2445
	Sun	E.	61 36 12	2834	60 2 28	2813	58 28 17	2793	56 53 40	2773
13	α Arietis	W.	86 11 15	2502	87 52 25	2484	89 34 1	2466	91 16 2	2448
	Aldebaran	W.	53 46 0	2351	55 30 45	2333	57 15 57	2315	59 1 35	2296
	Regulus	E.	26 22 29	2351	24 37 44	2333	22 52 33	2315	21 6 55	2297
	Sun	E.	48 54 3	2675	47 16 49	2655	45 39 9	2637	44 1 4	2618
14	α Arietis	W.	99 52 13	2367	101 36 35	2353	103 21 17	2339	105 6 19	2327
	Aldebaran	W.	67 56 48	2210	69 44 30	2194	71 33 7	2178	73 22 7	2163
	Sun	E.	35 44 30	2532	34 4 1	2516	32 23 10	2501	30 41 58	2487
15	Aldebaran	W.	82 32 42	2094	84 23 51	2081	86 15 19	2070	88 7 4	2059
	Pollux	W.	39 15 17	2226	41 3 6	2204	42 51 28	2184	44 40 20	2165
	Sun	E.	22 11 35	2435	20 28 50	2430	18 45 58	2428	17 3 3	2431
19	Sun	W.	34 35 43	2371	36 19 59	2381	38 4 1	2392	39 47 47	2404
	Antares	E.	38 21 20	2223	36 33 27	2248	34 46 11	2276	32 59 36	2308
	α Aquilæ	E.	86 53 47	2585	85 14 32	2599	83 35 36	2614	81 57 0	2631
20	Sun	W.	48 22 15	2470	50 4 11	2485	51 45 46	2500	53 26 59	2515
	Spica	W.	24 37 47	2322	26 23 14	2317	28 8 49	2315	29 54 26	2317
	α Aquilæ	E.	73 50 20	2738	72 14 30	2764	70 39 15	2792	69 4 36	2821
21	Sun	W.	61 47 34	2598	63 26 32	2615	65 5 6	2632	66 43 17	2650
	Spica	W.	38 40 58	2353	40 25 41	2364	42 10 8	2376	43 54 17	2389
	Jupiter	W.	24 25 37	2400	26 9 12	2410	27 52 33	2420	29 35 39	2433
	α Aquilæ	E.	61 21 47	3001	59 51 35	3043	58 22 16	3088	56 53 52	3137
	Fomalhaut	E.	93 38 8	2544	91 57 56	2559	90 18 5	2576	88 38 37	2593
22	Sun	W.	74 48 12	2739	76 24 0	2757	77 59 24	2775	79 34 25	2793
	Spica	W.	52 30 21	2457	54 12 35	2472	55 54 28	2487	57 35 59	2502

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22	JUPITER	W.	31° 18′ 27″	2445	33° 0′ 57″	2458	34° 43′ 9″	2472	36° 25′ 1″	2487
	α Aquilæ	E.	55 26 27	3188	54 0 3	3243	52 34 45	3303	51 10 37	3366
	Fomalhaut	E.	86 59 32	2610	85 20 51	2628	83 42 34	2646	82 4 42	2665
23	SUN	W.	81 9 2	2811	82 43 16	2828	84 17 7	2845	85 50 36	2863
	Spica	W.	59 17 9	2517	60 57 58	2532	62 38 27	2547	64 18 35	2562
	JUPITER	W.	44 49 12	2562	46 28 59	2577	48 8 25	2593	49 47 29	2609
	α Aquilæ	E.	44 29 39	3764	43 13 59	3865	42 0 4	3975	40 48 0	4098
	Fomalhaut	E.	74 1 54	2767	72 26 43	2788	70 52 0	2811	69 17 46	2834
	α Pegasi	E.	89 11 33	2813	87 37 22	2830	86 3 33	2848	84 30 7	2866
24	SUN	W.	93 32 27	2948	95 3 45	2964	96 34 43	2981	98 5 20	2997
	Spica	W.	72 34 6	2637	74 12 11	2651	75 49 57	2665	77 27 24	2679
	JUPITER	W.	57 57 37	2685	59 34 37	2699	61 11 18	2714	62 47 39	2729
	Antares	W.	27 39 40	2877	29 12 28	2865	30 45 32	2857	32 18 46	2852
	Fomalhaut	E.	61 34 15	2958	60 3 9	2985	58 32 37	3012	57 2 39	3041
	α Pegasi	E.	76 48 52	2962	75 17 51	2982	73 47 16	3003	72 17 7	3024
25	SUN	W.	105 33 34	3073	107 2 17	3087	108 30 43	3101	109 58 52	3114
	Spica	W.	85 29 58	2747	87 5 35	2760	88 40 55	2773	90 15 58	2785
	JUPITER	W.	70 44 44	2798	72 19 15	2811	73 53 29	2823	75 27 27	2836
	Antares	W.	40 5 31	2858	41 38 44	2862	43 11 52	2867	44 44 53	2873
	Fomalhaut	E.	49 42 12	3205	48 16 9	3243	46 50 51	3283	45 26 20	3327
	α Pegasi	E.	64 53 9	3139	63 25 47	3164	61 58 55	3190	60 32 34	3218
26	SUN	W.	117 15 29	3180	118 42 2	3193	120 8 20	3204	121 34 24	3215
	Spica	W.	98 7 14	2845	99 40 44	2856	101 13 59	2867	102 47 0	2877
	JUPITER	W.	83 13 16	2895	84 45 41	2906	86 17 52	2917	87 49 49	2927
	Antares	W.	52 27 56	2906	54 0 7	2914	55 32 8	2922	57 3 59	2929
	Fomalhaut	E.	38 37 24	3598	37 18 47	3667	36 1 25	3744	34 45 24	3828
	α Pegasi	E.	53 29 12	3369	52 6 20	3404	50 44 8	3441	49 22 38	3480
	α Arietis	E.	95 23 28	2966	93 52 33	2977	92 21 51	2986	90 51 21	2997
27	SUN	W.	128 41 25	3270	130 6 11	3281	131 30 45	3290	132 55 8	3300
	JUPITER	W.	95 26 24	2976	96 57 7	2985	98 27 39	2993	99 58 0	3002
	Antares	W.	64 41 0	2965	66 11 57	2971	67 42 46	2978	69 13 26	2985
	α Pegasi	E.	42 47 1	3723	41 30 38	3784	40 15 19	3850	39 1 8	3922
	α Arietis	E.	83 22 2	3047	81 52 47	3056	80 23 44	3066	78 54 53	3076
28	Antares	W.	76 44 42	3017	78 14 34	3023	79 44 18	3029	81 13 55	3034
	α Aquilæ	W.	38 7 24	4693	39 8 29	4588	40 11 4	4494	41 15 1	4409
	α Arietis	E.	71 33 37	3124	70 5 57	3134	68 38 29	3144	67 11 13	3155
	Aldebaran	E.	103 9 27	2955	101 38 18	2962	100 7 18	2969	98 36 26	2975
29	Antares	W.	88 40 22	3060	90 9 20	3065	91 38 12	3070	93 6 58	3074
	α Aquilæ	W.	46 51 40	4097	48 1 45	4050	49 12 35	4009	50 24 6	3970
	α Arietis	E.	59 58 1	3208	58 32 1	3220	57 6 15	3231	55 40 43	3244
	Aldebaran	E.	91 3 56	3002	89 33 46	3007	88 3 42	3012	86 33 44	3016
30	α Aquilæ	W.	56 30 9	3825	57 44 45	3803	58 59 44	3782	60 15 5	3764
	α Arietis	E.	48 36 57	3316	47 13 4	3333	45 49 31	3351	44 26 19	3372
	Aldebaran	E.	79 5 12	3036	77 35 44	3039	76 6 20	3043	74 37 0	3046

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Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
22	JUPITER	W.	38 6 33	2502	39 47 44	2516	41 28 35	2532	43 9 4	2547
	α Aquilæ	E.	49 47 42	3434	48 26 4	3506	47 5 47	3586	45 46 57	3671
	Fomalhaut	E.	80 27 15	2684	78 50 14	2704	77 13 40	2725	75 37 33	2746
23	SUN	W.	87 23 42	2880	88 56 26	2898	90 28 48	2915	92 0 48	2931
	Spica	W.	65 58 22	2577	67 37 49	2592	69 16 55	2607	70 55 41	2622
	JUPITER	W.	51 26 12	2624	53 4 34	2639	54 42 36	2655	56 20 17	2670
	α Aquilæ	E.	39 37 56	4231	38 29 59	4378	37 24 18	4542	36 21 3	4726
	Fomalhaut	E.	67 44 2	2857	66 10 48	2881	64 38 5	2906	63 5 54	2931
	α Pegasi	E.	82 57 4	2884	81 24 25	2903	79 52 10	2922	78 20 19	2941
24	SUN	W.	99 35 37	3013	101 5 34	3028	102 35 12	3043	104 4 32	3057
	Spica	W.	79 4 32	2693	80 41 21	2707	82 17 51	2721	83 54 3	2734
	JUPITER	W.	64 23 41	2743	65 59 24	2756	67 34 49	2771	69 9 55	2784
	Antares	W.	33 52 6	2850	35 25 29	2850	36 58 52	2852	38 32 13	2854
	Fomalhaut	E.	55 33 17	3071	54 4 32	3102	52 36 25	3135	51 8 58	3169
	α Pegasi	E.	70 47 24	3046	69 18 8	3069	67 49 20	3091	66 21 0	3115
25	SUN	W.	111 26 44	3129	112 54 19	3142	114 21 38	3155	115 48 41	3168
	Spica	W.	91 50 45	2798	93 25 16	2810	94 59 31	2822	96 33 30	2834
	JUPITER	W.	77 1 8	2848	78 34 33	2860	80 7 43	2873	81 40 37	2884
	Antares	W.	46 17 46	2880	47 50 31	2886	49 23 8	2893	50 55 36	2899
	Fomalhaut	E.	44 2 40	3372	42 39 52	3423	41 18 1	3476	39 57 10	3535
	α Pegasi	E.	59 6 46	3246	57 41 31	3274	56 16 49	3304	54 52 42	3336
26	SUN	W.	123 0 15	3227	124 25 52	3238	125 51 16	3249	127 16 27	3260
	Spica	W.	104 19 48	2888	105 52 22	2898	107 24 43	2908	108 56 52	2917
	JUPITER	W.	89 21 33	2937	90 53 5	2947	92 24 24	2958	93 55 30	2967
	Antares	W.	58 35 41	2935	60 7 15	2943	61 38 39	2950	63 9 54	2958
	Fomalhaut	E.	33 30 51	3923	32 17 55	4031	31 6 46	4151	29 57 33	4287
	α Pegasi	E.	48 1 52	3522	46 41 52	3567	45 22 42	3615	44 4 24	3666
	α Arietis	E.	89 21 4	3007	87 51 0	3017	86 21 8	3027	84 51 29	3037
27	SUN	W.	134 19 19	3310	135 43 19	3319	137 7 8	3328	138 30 47	3338
	JUPITER	W.	101 28 10	3010	102 58 10	3018	104 28 1	3026	105 57 42	3033
	Antares	W.	70 43 57	2992	72 14 20	2998	73 44 35	3005	75 14 42	3010
	α Pegasi	E.	37 48 11	4003	36 36 34	4091	35 26 24	4189	34 17 48	4301
	α Arietis	E.	77 26 14	3086	75 57 47	3096	74 29 32	3105	73 1 29	3114
28	Antares	W.	82 43 26	3039	84 12 50	3045	85 42 7	3050	87 11 18	3056
	α Aquilæ	W.	42 20 14	4333	43 26 36	4265	44 34 1	4203	45 42 24	4147
	α Arietis	E.	65 44 10	3165	64 17 19	3175	62 50 40	3186	61 24 14	3197
	Aldebaran	E.	97 5 42	2981	95 35 5	2986	94 4 35	2992	92 34 12	2997
29	Antares	W.	94 35 39	3079	96 4 14	3083	97 32 44	3088	99 1 8	3092
	α Aquilæ	W.	51 36 15	3936	52 48 58	3905	54 2 13	3875	55 15 58	3850
	α Arietis	E.	54 15 26	3257	52 50 24	3270	51 25 38	3285	50 1 9	3300
	Aldebaran	E.	85 3 51	3021	83 34 4	3025	82 4 22	3029	80 34 45	3032
30	α Aquilæ	W.	61 30 45	3747	62 46 42	3731	64 2 56	3716	65 19 26	3703
	α Arietis	E.	43 3 30	3393	41 41 6	3416	40 19 8	3442	38 57 39	3470
	Aldebaran	E.	73 7 44	3048	71 38 31	3051	70 9 21	3054	68 40 15	3056

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sat.	1	12 29 17.58	9.052	S. 3 9 54.4	–58.25	16 1.46	64.36	10 17.11	0.802
SUN.	2	12 32 54.98	9.065	3 33 11.3	58.16	16 1.74	64.40	10 36.21	0.789
Mon.	3	12 36 32.69	9.078	3 56 25.8	58.05	16 2.01	64.45	10 54.99	0.776
Tues.	4	12 40 10.73	9.093	4 19 37.6	–57.93	16 2.29	64.50	11 13.45	0.761
Wed.	5	12 43 49.14	9.108	4 42 46.3	57.79	16 2.56	64.56	11 31.55	0.746
Thur.	6	12 47 27.92	9.125	5 5 51.6	57.64	16 2.84	64.61	11 49.27	0.729
Frid.	7	12 51 7.11	9.142	5 28 53.1	–57.48	16 3.11	64.67	12 6.59	0.712
Sat.	8	12 54 46.72	9.160	5 51 50.5	57.29	16 3.39	64.73	12 23.48	0.694
SUN.	9	12 58 26.79	9.179	6 14 43.4	57.10	16 3.66	64.80	12 39.92	0.675
Mon.	10	13 2 7.31	9.199	6 37 31.5	–56.89	16 3.93	64.86	12 55.91	0.655
Tues.	11	13 5 48.32	9.219	7 0 14.4	56.67	16 4.20	64.93	13 11.40	0.635
Wed.	12	13 9 29.84	9.241	7 22 51.7	56.43	16 4.47	65.00	13 26.39	0.613
Thur.	13	13 13 11.88	9.263	7 45 23.0	–56.17	16 4.75	65.07	13 40.86	0.591
Frid.	14	13 16 54.46	9.286	8 7 48.0	55.90	16 5.02	65.15	13 54.80	0.568
Sat.	15	13 20 37.59	9.309	8 30 6.4	55.61	16 5.29	65.23	14 8.20	0.545
SUN.	16	13 24 21.28	9.333	8 52 17.6	–55.30	16 5.56	65.31	14 21.03	0.521
Mon.	17	13 28 5.55	9.357	9 14 21.2	54.98	16 5.84	65.40	14 33.27	0.497
Tues.	18	13 31 50.41	9.382	9 36 16.9	54.64	16 6.11	65.49	14 44.92	0.472
Wed.	19	13 35 35.88	9.407	9 58 4.3	–54.29	16 6.38	65.58	14 55.97	0.447
Thur.	20	13 39 21.98	9.433	10 19 42.8	53.92	16 6.65	65.67	15 6.40	0.421
Frid.	21	13 43 8.71	9.460	10 41 12.2	53.53	16 6.93	65.77	15 16.20	0.394
Sat.	22	13 46 56.08	9.487	11 2 32.1	–53.12	16 7.20	65.87	15 25.36	0.367
SUN.	23	13 50 44.11	9.516	11 23 42.0	52.70	16 7.47	65.97	15 33.86	0.339
Mon.	24	13 54 32.82	9.544	11 44 41.5	52.25	16 7.74	66.07	15 41.68	0.311
Tues.	25	13 58 22.22	9.573	12 5 30.1	–51.79	16 8.02	66.18	15 48.82	0.282
Wed.	26	14 2 12.32	9.602	12 26 7.4	51.31	16 8.29	66.28	15 55.26	0.253
Thur.	27	14 6 3.13	9.632	12 46 33.2	50.82	16 8.55	66.39	16 0.98	0.223
Frid.	28	14 9 54.67	9.664	13 6 47.0	–50.31	16 8.81	66.50	16 5.97	0.192
Sat.	29	14 13 46.96	9.694	13 26 48.5	49.79	16 9.07	66.61	16 10.22	0.161
SUN.	30	14 17 40.01	9.726	13 46 37.2	49.25	16 9.33	66.72	16 13.72	0.129
Mon.	31	14 21 33.84	9.759	14 6 12.6	48.69	16 9.58	66.83	16 16.44	0.096
Tues.	32	14 25 28.46	9.792	S. 14 25 34.4	–48.11	16 9.83	66.94	16 18.38	0.063

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^s.18$ from the sidereal time.
The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Sat.	1	12 29 19.13	9.054	S. 3 10 4.4	−58.26	10 17.24	0.802	12 39 36.37
SUN.	2	12 32 56.58	9.067	3 33 21.6	58.17	10 36.34	0.789	12 43 32.92
Mon.	3	12 36 34.34	9.080	3 56 36.4	58.06	10 55.13	0.776	12 47 29.47
Tues.	4	12 40 12.43	9.095	4 19 48.5	−57.94	11 13.59	0.761	12 51 26.03
Wed.	5	12 43 50.89	9.110	4 42 57.5	57.80	11 31.69	0.746	12 55 22.57
Thur.	6	12 47 29.72	9.127	5 6 3.0	57.65	11 49.41	0.729	12 59 19.13
Frid.	7	12 51 8.95	9.144	5 29 4.7	−57.49	12 6.73	0.712	13 3 15.68
Sat.	8	12 54 48.61	9.162	5 52 2.3	57.30	12 23.62	0.694	13 7 12.23
SUN.	9	12 58 28.72	9.181	6 14 55.5	57.11	12 40.06	0.675	13 11 8.78
Mon.	10	13 2 9.29	9.201	6 37 43.8	−56.90	12 56.05	0.655	13 15 5.34
Tues.	11	13 5 50.35	9.221	7 0 26.9	56.68	13 11.54	0.635	13 19 1.89
Wed.	12	13 9 31.91	9.243	7 23 4.4	56.44	13 26.53	0.613	13 22 58.44
Thur.	13	13 13 13.99	9.265	7 45 35.9	−56.18	13 41.00	0.591	13 26 54.99
Frid.	14	13 16 56.61	9.288	8 8 1.1	55.91	13 54.94	0.568	13 30 51.55
Sat.	15	13 20 39.78	9.311	8 30 19.6	55.62	14 8.33	0.545	13 34 48.10
SUN.	16	13 24 23.51	9.335	8 52 30.9	−55.31	14 21.15	0.521	13 38 44.66
Mon.	17	13 28 7.82	9.359	9 14 34.6	54.99	14 33.39	0.497	13 42 41.21
Tues.	18	13 31 52.72	9.384	9 36 30.4	54.65	14 45.04	0.472	13 46 37.76
Wed.	19	13 35 38.23	9.409	9 58 17.9	−54.29	14 56.08	0.447	13 50 34.31
Thur.	20	13 39 24.36	9.435	10 19 56.5	53.92	15 6.51	0.421	13 54 30.87
Frid.	21	13 43 11.12	9.462	10 41 25.9	53.53	15 16.30	0.394	13 58 27.42
Sat.	22	13 46 58.52	9.489	11 2 45.8	−53.12	15 25.45	0.367	14 2 23.97
SUN.	23	13 50 46.58	9.517	11 23 55.7	52.70	15 33.94	0.339	14 6 20.52
Mon.	24	13 54 35.32	9.545	11 44 55.2	52.25	15 41.76	0.311	14 10 17.08
Tues.	25	13 58 24.75	9.574	12 5 43.8	−51.79	15 48.89	0.282	14 14 13.63
Wed.	26	14 2 14.87	9.603	12 26 21.1	51.31	15 55.32	0.253	14 18 10.19
Thur.	27	14 6 5.71	9.633	12 46 46.8	50.82	16 1.03	0.223	14 22 6.74
Frid.	28	14 9 57.27	9.664	13 7 0.5	−50.31	16 6.02	0.192	14 26 3.29
Sat.	29	14 13 49.58	9.695	13 27 1.9	49.79	16 10.26	0.161	14 29 59.84
SUN.	30	14 17 42.65	9.727	13 46 50.5	49.25	16 13.75	0.129	14 33 56.40
Mon.	31	14 21 36.49	9.760	14 6 25.8	48.69	16 16.46	0.096	14 37 52.95
Tues.	32	14 25 31.12	9.793	S. 14 25 47.5	−48.11	16 18.39	0.063	14 41 49.50

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour,
+ 9s.8565.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	274	187 59 14.0	58 48.8	147.59	− 0.08	0.0002428	−52.3	11 18 32.17
2	275	188 58 17.2	57 52.0	147.68	0.16	0.0001175	52.1	11 14 36.26
3	276	189 57 22.5	56 57.2	147.77	0.21	9.9999926	51.9	11 10 40.35
4	277	190 56 30.0	56 4.6	147.86	− 0.24	9.9998681	−51.7	11 6 44.44
5	278	191 55 39.6	55 14.1	147.95	0.23	9.9997442	51.5	11 2 48.53
6	279	192 54 51.4	54 25.8	148.04	0.19	9.9996208	51.3	10 58 52.64
7	280	193 54 5.5	53 39.8	148.13	− 0.13	9.9994979	−51.1	10 54 56.73
8	281	194 53 21.9	52 56.2	148.23	− 0.04	9.9993753	51.0	10 51 0.82
9	282	195 52 40.7	52 14.9	148.33	+ 0.07	9.9992529	50.9	10 47 4.91
10	283	196 52 1.8	51 35.9	148.43	+ 0.20	9.9991308	−50.9	10 43 9.01
11	284	197 51 25.2	50 59.2	148.52	0.34	9.9990088	50.9	10 39 13.10
12	285	198 50 50.9	50 24.8	148.62	0.48	9.9988867	51.0	10 35 17.19
13	286	199 50 19.0	49 52.8	148.72	+ 0.61	9.9987645	−51.0	10 31 21.29
14	287	200 49 49.3	49 23.0	148.81	0.73	9.9986421	51.0	10 27 25.38
15	288	201 49 21.8	48 55.4	148.90	0.83	9.9985196	51.1	10 23 29.47
16	289	202 48 56.4	48 29.9	148.98	+ 0.91	9.9983969	−51.1	10 19 33.57
17	290	203 48 33.0	48 6.4	149.07	0.96	9.9982740	51.2	10 15 37.66
18	291	204 48 11.7	47 45.0	149.15	0.97	9.9981509	51.2	10 11 41.76
19	292	205 47 52.4	47 25.6	149.23	+ 0.95	9.9980278	−51.3	10 7 45.85
20	293	206 47 34.9	47 8.0	149.31	0.91	9.9979047	51.3	10 3 49.94
21	294	207 47 19.2	46 52.2	149.38	0.84	9.9977816	51.2	9 59 54.03
22	295	208 47 5.2	46 38.1	149.46	+ 0.75	9.9976587	−51.1	9 55 58.13
23	296	209 46 53.0	46 25.8	149.53	0.64	9.9975363	50.9	9 52 2.22
24	297	210 46 42.5	46 15.2	149.60	0.51	9.9974145	50.6	9 48 6.31
25	298	211 46 33.6	46 6.2	149.67	+ 0.38	9.9972934	−50.3	9 44 10.40
26	299	212 46 26.4	45 58.9	149.74	0.24	9.9971730	49.9	9 40 14.50
27	300	213 46 20.9	45 53.3	149.81	0.12	9.9970537	49.4	9 36 18.59
28	301	214 46 17.1	45 49.4	149.88	+ 0.01	9.9969356	−48.9	9 32 22.68
29	302	215 46 15.0	45 47.2	149.95	− 0.07	9.9968189	48.3	9 28 26.78
30	303	216 46 14.7	45 46.8	150.02	0.13	9.9967036	47.7	9 24 30.87
31	304	217 46 16.1	45 48.1	150.10	0.16	9.9965897	47.1	9 20 34.97
32	305	218 46 19.4	45 51.2	150.17	− 0.16	9.9964774	−46.4	9 16 39.06

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0ᵈ.0.

Diff. for 1 Hour,
— 9ˢ.8296.
(Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 45.3	14 44.4	54 2.0	−0.31	53 58.9	−0.20	11 49.0	1.74	13.9
2	14 43.9	14 43.8	53 57.1	−0.09	53 56.7	+0.02	12 30.8	1.74	14.9
3	14 44.0	14 44.7	53 57.5	+0.13	53 59.8	0.25	13 12.9	1.77	15.9
4	14 45.7	14 47.2	54 3.6	+0.38	54 9.0	+0.51	13 56.1	1.82	16.9
5	14 49.0	14 51.4	54 15.9	0.64	54 24.4	0.78	14 40.6	1.89	17.9
6	14 54.2	14 57.5	54 34.7	0.94	54 46.9	1.10	15 27.0	1.98	18.9
7	15 1.3	15 5.7	55 1.0	+1.26	55 17.1	+1.43	16 15.6	2.07	19.9
8	15 10.6	15 16.1	55 35.2	1.59	55 55.3	1.75	17 6.3	2.15	20.9
9	15 22.1	15 28.5	56 17.2	1.90	56 40.9	2.04	17 58.8	2.22	21.9
10	15 35.4	15 42.7	57 6.2	+2.17	57 32.9	+2.27	18 52.7	2.26	22.9
11	15 50.2	15 57.9	58 0.6	2.33	58 28.8	2.35	19 47.3	2.28	23.9
12	16 5.6	16 13.1	58 57.0	2.33	59 24.6	2.26	20 42.2	2.29	24.9
13	16 20.3	16 27.0	59 51.1	+2.13	60 15.6	+1.93	21 37.1	2.29	25.9
14	16 32.9	16 38.0	60 37.4	1.68	60 55.9	1.38	22 32.1	2.30	26.9
15	16 41.9	16 44.6	61 10.4	1.02	61 20.4	+0.63	23 27.5	2.32	27.9
16	16 46.0	16 46.0	61 25.5	+0.21	61 25.4	−0.23	ó		28.9
17	16 44.5	16 41.8	61 20.1	−0.65	61 9.9	1.04	0 23.6	2.35	0.6
18	16 37.7	16 32.6	60 55.1	1.40	60 36.2	1.72	1 20.5	2.39	1.6
19	16 26.5	16 19.6	60 13.8	−1.98	59 48.6	−2.19	2 18.1	2.41	2.6
20	16 12.2	16 4.5	59 21.4	2.32	58 53.0	2.39	3 15.9	2.40	3.6
21	15 56.6	15 48.7	58 24.0	2.42	57 55.0	2.39	4 12.8	2.34	4.6
22	15 41.0	15 33.5	57 26.6	−2.33	56 59.2	−2.23	5 8.1	2.25	5.6
23	15 26.4	15 19.8	56 33.2	2.09	56 9.0	1.94	6 0.8	2.13	6.6
24	15 13.8	15 8.3	55 46.7	1.77	55 26.5	1.60	6 50.7	2.02	7.6
25	15 3.3	14 59.0	55 8.4	−1.42	54 52.5	−1.23	7 37.9	1.91	8.6
26	14 55.3	14 52.2	54 38.8	1.05	54 27.3	0.88	8 22.8	1.83	9.6
27	14 49.6	14 47.5	54 17.8	0.71	54 10.3	0.55	9 5.9	1.77	10.6
28	14 46.0	14 45.0	54 4.7	−0.39	54 0.9	−0.25	9 48.0	1.74	11.6
29	14 44.4	14 44.2	53 58.7	−0.12	53 58.1	+0.01	10 29.6	1.74	12.6
30	14 44.4	14 45.0	53 58.9	+0.13	54 1.1	0.23	11 11.6	1.76	13.6
31	14 45.9	14 47.2	54 4.5	0.34	54 9.2	0.44	11 54.4	1.81	14.6
32	14 48.8	14 50.8	54 15.1	+0.54	54 22.2	+0.64	12 38.7	1.88	15.6

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 8 34.37	1.8647	S. 2 51 45.8	10.022
1	0 10 26.23	1.8639	2 41 44.2	10.032
2	0 12 18.04	1.8631	2 31 42.0	10.041
3	0 14 9.80	1.8623	2 21 39.3	10.049
4	0 16 1.52	1.8616	2 11 36.1	10.057
5	0 17 53.20	1.8609	2 1 32.5	10.063
6	0 19 44.83	1.8603	1 51 28.5	10.070
7	0 21 36.43	1.8597	1 41 24.1	10.076
8	0 23 27.99	1.8591	1 31 19.4	10.082
9	0 25 19.52	1.8586	1 21 14.3	10.087
10	0 27 11.02	1.8581	1 11 9.0	10.090
11	0 29 2.49	1.8576	1 1 3.5	10.093
12	0 30 53.93	1.8572	0 50 57.8	10.096
13	0 32 45.35	1.8568	0 40 51.9	10.098
14	0 34 36.75	1.8565	0 30 46.0	10.099
15	0 36 28.13	1.8562	0 20 40.0	10.101
16	0 38 19.49	1.8559	0 10 33.9	10.102
17	0 40 10.84	1.8557	S. 0 0 27.8	10.101
18	0 42 2.18	1.8556	N. 0 9 38.2	10.100
19	0 43 53.51	1.8554	0 19 44.2	10.098
20	0 45 44.83	1.8553	0 29 50.0	10.096
21	0 47 36.15	1.8552	0 39 55.7	10.093
22	0 49 27.46	1.8552	0 50 1.2	10.090
23	0 51 18.78	1.8553	N. 1 0 6.5	10.087

SUNDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 53 10.10	1.8554	N. 1 10 11.6	10.083
1	0 55 1.43	1.8555	1 20 16.4	10.077
2	0 56 52.76	1.8556	1 30 20.8	10.070
3	0 58 44.10	1.8558	1 40 24.8	10.064
4	1 0 35.45	1.8560	1 50 28.4	10.057
5	1 2 26.82	1.8562	2 0 31.6	10.049
6	1 4 18.20	1.8565	2 10 34.3	10.041
7	1 6 9.60	1.8369	2 20 36.5	10.032
8	1 8 1.02	1.8573	2 30 38.1	10.022
9	1 9 52.47	1.8577	2 40 39.1	10.012
10	1 11 43.95	1.8581	2 50 39.5	10.001
11	1 13 35.46	1.8586	3 0 39.2	9.989
12	1 15 27.00	1.8592	3 10 38.2	9.977
13	1 17 18.57	1.8598	3 20 36.4	9.964
14	1 19 10.18	1.8604	3 30 33.9	9.951
15	1 21 1.82	1.8610	3 40 30.6	9.937
16	1 22 53.50	1.8617	3 50 26.4	9.922
17	1 24 45.23	1.8625	4 0 21.3	9.908
18	1 26 37.00	1.8633	4 10 15.4	9.893
19	1 28 28.82	1.8641	4 20 8.5	9.876
20	1 30 20.69	1.8649	4 30 0.5	9.858
21	1 32 12.61	1.8658	4 39 51.5	9.841
22	1 34 4.58	1.8667	4 49 41.4	9.823
23	1 35 56.61	1.8677	4 59 30.2	9.804
24	1 37 48.70	1.8687	N. 5 9 17.9	9.785

MONDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	h m s	s	° ′ ″	″
0	1 37 48.70	1.8687	N. 5 9 17.9	9.785
1	1 39 40.85	1.8697	5 19 4.4	9.764
2	1 41 33.07	1.8708	5 28 49.6	9.743
3	1 43 25.35	1.8719	5 38 33.6	9.722
4	1 45 17.70	1.8731	5 48 16.3	9.701
5	1 47 10.12	1.8743	5 57 57.7	9.678
6	1 49 2.61	1.8755	6 7 37.7	9.655
7	1 50 55.18	1.8767	6 17 16.3	9.631
8	1 52 47.82	1.8780	6 26 53.4	9.607
9	1 54 40.54	1.8794	6 36 29.1	9.582
10	1 56 33.35	1.8808	6 46 3.3	9.557
11	1 58 26.24	1.8822	6 55 35.9	9.530
12	2 0 19.21	1.8836	7 5 6.9	9.503
13	2 2 12.27	1.8851	7 14 36.3	9.476
14	2 4 5.42	1.8867	7 24 4.0	9.448
15	2 5 58.67	1.8882	7 33 30.0	9.419
16	2 7 52.01	1.8898	7 42 54.3	9.390
17	2 9 45.45	1.8915	7 52 16.8	9.359
18	2 11 38.99	1.8932	8 1 37.4	9.328
19	2 13 32.63	1.8948	8 10 56.2	9.297
20	2 15 26.37	1.8965	8 20 13.1	9.266
21	2 17 20.21	1.8983	8 29 28.1	9.233
22	2 19 14.16	1.9001	8 38 41.1	9.200
23	2 21 8.22	1.9020	N. 8 47 52.1	9.167

TUESDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
0	2 23 2.40	1.9039	N. 8 57 1.1	9.133
1	2 24 56.69	1.9058	9 6 8.0	9.098
2	2 26 51.09	1.9077	9 15 12.8	9.062
3	2 28 45.61	1.9097	9 24 15.4	9.025
4	2 30 40.25	1.9117	9 33 15.8	8.989
5	2 32 35.01	1.9137	9 42 14.0	8.952
6	2 34 29.90	1.9158	9 51 10.0	8.914
7	2 36 24.91	1.9179	10 0 3.7	8.875
8	2 38 20.05	1.9201	10 8 55.0	8.835
9	2 40 15.32	1.9223	10 17 43.9	8.795
10	2 42 10.72	1.9245	10 26 30.4	8.754
11	2 44 6.26	1.9267	10 35 14.4	8.713
12	2 46 1.93	1.9290	10 43 55.9	8.671
13	2 47 57.74	1.9313	10 52 34.9	8.628
14	2 49 53.68	1.9336	11 1 11.3	8.585
15	2 51 49.77	1.9360	11 9 45.1	8.542
16	2 53 46.00	1.9384	11 18 16.3	8.497
17	2 55 42.38	1.9408	11 26 44.8	8.452
18	2 57 38.90	1.9432	11 35 10.5	8.406
19	2 59 35.57	1.9457	11 43 33.5	8.360
20	3 1 32.39	1.9482	11 51 53.7	8.313
21	3 3 29.36	1.9507	12 0 11.1	8.266
22	3 5 26.48	1.9533	12 8 25.6	8.217
23	3 7 23.76	1.9559	12 16 37.1	8.167
24	3 9 21.19	1.9585	N.12 24 45.7	8.118

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 5.					**FRIDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 9 21.19	1.9585	N.12 24 45.7	8.118	0	4 46 48.90	2.1086	N.17 45 4.3	4.979
1	3 11 18.78	1.9612	12 32 51.3	8.068	1	4 48 55.52	2.1120	17 50 0.6	4.898
2	3 13 16.53	1.9639	12 40 53.9	8.017	2	4 51 2.34	2.1153	17 54 52.0	4.816
3	3 15 14.45	1.9667	12 48 53.4	7.966	3	4 53 9.36	2.1187	17 59 38.5	4.734
4	3 17 12.53	1.9694	12 56 49.8	7.914	4	4 55 16.59	2.1222	18 4 20.1	4.651
5	3 19 10.77	1.9721	13 4 43.0	7.861	5	4 57 24.02	2.1256	18 8 56.6	4.567
6	3 21 9.18	1.9749	13 12 33.1	7.808	6	4 59 31.66	2.1290	18 13 28.1	4.482
7	3 23 7.76	1.9777	13 20 20.0	7.754	7	5 1 39.50	2.1324	18 17 54.5	4.397
8	3 25 6.51	1.9805	13 28 3.6	7.699	8	5 3 47.55	2.1358	18 22 15.7	4.311
9	3 27 5.42	1.9834	13 35 43.9	7.643	9	5 5 55.80	2.1392	18 26 31.8	4.226
10	3 29 4.51	1.9863	13 43 20.8	7.587	10	5 8 4.25	2.1425	18 30 42.8	4.140
11	3 31 3.78	1.9892	13 50 54.3	7.530	11	5 10 12.90	2.1459	18 34 48.6	4.052
12	3 33 3.22	1.9922	13 58 24.4	7.473	12	5 12 21.76	2.1493	18 38 49.1	3.964
13	3 35 2.84	1.9951	14 5 51.1	7.416	13	5 14 30.82	2.1527	18 42 44.3	3.875
14	3 37 2.63	1.9980	14 13 14.3	7.357	14	5 16 40.08	2.1561	18 46 34.1	3.786
15	3 39 2.60	2.0010	14 20 33.9	7.298	15	5 18 49.55	2.1595	18 50 18.6	3.697
16	3 41 2.75	2.0041	14 27 50.0	7.238	16	5 20 59.22	2.1628	18 53 57.7	3.606
17	3 43 3.09	2.0072	14 35 2.5	7.177	17	5 23 9.09	2.1662	18 57 31.3	3.515
18	3 45 3.61	2.0102	14 42 11.3	7.116	18	5 25 19.16	2.1695	19 0 59.5	3.424
19	3 47 4.31	2.0132	14 49 16.4	7.054	19	5 27 29.43	2.1728	19 4 22.2	3.332
20	3 49 5.20	2.0163	14 56 17.8	6.992	20	5 29 39.90	2.1761	19 7 39.3	3.239
21	3 51 6.27	2.0194	15 3 15.4	6.929	21	5 31 50.57	2.1794	19 10 50.8	3.145
22	3 53 7.53	2.0226	15 10 9.2	6.865	22	5 34 1.43	2.1827	19 13 56.7	3.051
23	3 55 8.98	2.0257	N.15 16 59.2	6.801	23	5 36 12.49	2.1860	N.19 16 56.9	2.957
	THURSDAY 6.					**SATURDAY 8.**			
0	3 57 10.61	2.0288	N.15 23 45.3	6.735	0	5 38 23.75	2.1892	N 19 19 51,5	2.862
1	3 59 12.43	2.0320	15 30 27.4	6.669	1	5 40 35.20	2.1925	19 22 40.4	2.767
2	4 1 14.45	2.0353	15 37 5.6	6.603	2	5 42 46.85	2.1957	19 25 23.5	2.670
3	4 3 16.67	2.0386	15 43 39.8	6.536	3	5 44 58.69	2.1989	19 28 0.8	2.573
4	4 5 19.08	2.0418	15 50 9.9	6.468	4	5 47 10.72	2.2021	19 30 32.3	2.476
5	4 7 21.68	2.0449	15 56 36.0	6.401	5	5 49 22.94	2.2053	19 32 58.0	2.379
6	4 9 24.47	2.0482	16 2 58.0	6.332	6	5 51 35.36	2.2086	19 35 17.8	2.281
7	4 11 27.46	2.0515	16 9 15.8	6.262	7	5 53 47.97	2.2117	19 37 31.7	2.182
8	4 13 30.65	2.0547	16 15 29.4	6.191	8	5 56 0.76	2.2147	19 39 39.6	2.082
9	4 15 34.03	2.0580	16 21 38.7	6.120	9	5 58 13.73	2.2177	19 41 41.5	1.982
10	4 17 37.61	2.0613	16 27 43.8	6.049	10	6 0 26.89	2.2208	19 43 37.4	1.882
11	4 19 41.39	2.0647	16 33 44.6	5.977	11	6 2 40.23	2.2239	19 45 27.3	1.782
12	4 21 45.38	2.0681	16 39 41.0	5.904	12	6 4 53.76	2.2270	19 47 11.2	1.680
13	4 23 49.57	2.0714	16 45 33.0	5.830	13	6 7 7.47	2.2300	19 48 48.9	1.578
14	4 25 53.95	2.0747	16 51 20.6	5.756	14	6 9 21.36	2.2330	19 50 20.5	1.476
15	4 27 58.53	2.0780	16 57 3.7	5.681	15	6 11 35.43	2.2360	19 51 46.0	1.373
16	4 30 3.31	2.0814	17 2 42.3	5.606	16	6 13 49.68	2.2389	19 53 5.3	1.269
17	4 32 8.30	2.0848	17 8 16.4	5.530	17	6 16 4.10	2.2418	19 54 18.3	1.165
18	4 34 13.49	2.0882	17 13 45.9	5.453	18	6 18 18.69	2.2447	19 55 25.1	1.061
19	4 36 18.88	2.0916	17 19 10.7	5.375	19	6 20 33.46	2.2476	19 56 25.6	0.956
20	4 38 24.48	2.0950	17 24 30.9	5.297	20	6 22 48.40	2.2503	19 57 19.8	0.851
21	4 40 30.28	2.0983	17 29 46.4	5.218	21	6 25 3.50	2.2531	19 58 7.7	0.746
22	4 42 36.28	2.1017	17 34 57.1	5.139	22	6 27 18.77	2.2559	19 58 49.3	0.641
23	4 44 42.49	2.1052	17 40 3.1	5.060	23	6 29 34.21	2.2587	19 59 24.6	0.535
24	4 46 48.90	2.1086	N.17 45 4.3	4.979	24	6 31 49.82	2.2615	N.19 59 53.5	0.428

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 9.				
	h m s	s	° ′ ″	″
0	6 31 49.82	2.2615	N.19 59 53.5	0.428
1	6 34 5.59	2.2642	20 0 15.9	0.320
2	6 36 21.52	2.2668	20 0 31.9	0.212
3	6 38 37.60	2.2694	20 0 41.4	+0.104
4	6 40 53.84	2.2720	20 0 44.4	−0.004
5	6 43 10.24	2.2746	20 0 40.9	0.113
6	6 45 26.79	2.2771	20 0 30.8	0.222
7	6 47 43.49	2.2796	20 0 14.2	0.332
8	6 50 0.34	2.2821	19 59 51.0	0.442
9	6 52 17.34	2.2845	19 59 21.2	0.552
10	6 54 34.48	2.2869	19 58 44.8	0.662
11	6 56 51.77	2.2893	19 58 1.8	0.772
12	6 59 9.20	2.2917	19 57 12.1	0.883
13	7 1 26.77	2.2939	19 56 15.8	0.994
14	7 3 44.47	2.2962	19 55 12.8	1.107
15	7 6 2.31	2.2984	19 54 3.0	1.220
16	7 8 20.28	2.3006	19 52 46.4	1.332
17	7 10 38.38	2.3027	19 51 23.1	1.445
18	7 12 56.61	2.3048	19 49 53.0	1.557
19	7 15 14.96	2.3069	19 48 16.2	1.670
20	7 17 33.44	2.3090	19 46 32.6	1.783
21	7 19 52.04	2.3110	19 44 42.2	1.897
22	7 22 10.76	2.3130	19 42 45.0	2.010
23	7 24 29.60	2.3149	N.19 40 41.0	2.124
MONDAY 10.				
0	7 26 48.55	2.3168	N.19 38 30.1	2.238
1	7 29 7.62	2.3187	19 36 12.4	2.352
2	7 31 26.80	2.3205	19 33 47.8	2.467
3	7 33 46.08	2.3222	19 31 16.4	2.581
4	7 36 5.47	2.3240	19 28 38.1	2.696
5	7 38 24.96	2.3257	19 25 52.9	2.811
6	7 40 44.55	2.3273	19 23 0.8	2.926
7	7 43 4.24	2.3290	19 20 1.8	3.041
8	7 45 24.03	2.3306	19 16 55.9	3.155
9	7 47 43.91	2.3322	19 13 43.2	3.269
10	7 50 3.89	2.3337	19 10 23.6	3.385
11	7 52 23.96	2.3352	19 6 57.0	3.501
12	7 54 44.11	2.3366	19 3 23.5	3.616
13	7 57 4.35	2.3380	18 59 43.1	3.731
14	7 59 24.67	2.3394	18 55 55.8	3.846
15	8 1 45.08	2.3408	18 52 1.6	3.961
16	8 4 5.57	2.3421	18 48 0.5	4.077
17	8 6 26.13	2.3433	18 43 52.4	4.192
18	8 8 46.76	2.3445	18 39 37.4	4.307
19	8 11 7.47	2.3457	18 35 15.5	4.422
20	8 13 28.25	2.3468	18 30 46.8	4.536
21	8 15 49.09	2.3479	18 26 11.2	4.651
22	8 18 10.00	2.3491	18 21 28.7	4.766
23	8 20 30.98	2.3502	18 16 39.3	4.881
24	8 22 52.02	2.3512	N.18 11 43.0	4.995
TUESDAY 11.				
	h m s	s	° ′ ″	″
0	8 22 52.02	2.3512	N.18 11 43.0	4.996
1	8 25 13.12	2.3521	18 6 39.9	5.109
2	8 27 34.27	2.3530	18 1 29.9	5.223
3	8 29 55.48	2.3539	17 56 13.1	5.337
4	8 32 16.74	2.3548	17 50 49.5	5.451
5	8 34 38.06	2.3557	17 45 19.0	5.565
6	8 36 59.43	2.3565	17 39 41.7	5.678
7	8 39 20.84	2.3573	17 33 57.7	5.790
8	8 41 42.30	2.3581	17 28 6.9	5.903
9	8 44 3.81	2.3588	17 22 9.3	6.016
10	8 46 25.36	2.3595	17 16 5.0	6.128
11	8 48 46.95	2.3601	17 9 54.0	6.240
12	8 51 8.57	2.3607	17 3 36.2	6.352
13	8 53 30.23	2.3613	16 57 11.8	6.463
14	8 55 51.93	2.3619	16 50 40.7	6.573
15	8 58 13.66	2.3624	16 44 3.0	6.683
16	9 0 35.42	2.3629	16 37 18.7	6.793
17	9 2 57.21	2.3635	16 30 27.8	6.903
18	9 5 19.04	2.3640	16 23 30.4	7.012
19	9 7 40.89	2.3644	16 16 26.4	7.121
20	9 10 2.76	2.3648	16 9 15.9	7.229
21	9 12 24.66	2.3652	16 1 59.0	7.336
22	9 14 46.58	2.3655	15 54 35.6	7.444
23	9 17 8.52	2.3659	N.15 47 5.7	7.552
WEDNESDAY 12.				
0	9 19 30.49	2.3662	N.15 39 29.4	7.658
1	9 21 52.47	2.3665	15 31 46.8	7.763
2	9 24 14.47	2.3668	15 23 57.9	7.868
3	9 26 36.49	2.3671	15 16 2.6	7.973
4	9 28 58.52	2.3673	15 8 1.1	8.077
5	9 31 20.56	2.3675	14 59 53.4	8.180
6	9 33 42.62	2.3677	14 51 39.5	8.282
7	9 36 4.69	2.3679	14 43 19.5	8.384
8	9 38 26.77	2.3681	14 34 53.4	8.486
9	9 40 48.86	2.3682	14 26 21.2	8.587
10	9 43 10.96	2.3684	14 17 42.9	8.688
11	9 45 33.07	2.3686	14 8 58.6	8.787
12	9 47 55.19	2.3687	14 0 8.4	8.886
13	9 50 17.31	2.3688	13 51 12.3	8.984
14	9 52 39.44	2.3689	13 42 10.4	9.081
15	9 55 1.58	2.3690	13 33 2.6	9.177
16	9 57 23.72	2.3690	13 23 49.1	9.272
17	9 59 45.86	2.3690	13 14 29.9	9.367
18	10 2 8.00	2.3691	13 5 5.0	9.461
19	10 4 30.15	2.3692	12 55 34.5	9.554
20	10 6 52.30	2.3692	12 45 58.5	9.647
21	10 9 14.45	2.3692	12 36 16.9	9.739
22	10 11 36.60	2.3692	12 26 29.8	9.829
23	10 13 58.76	2.3693	12 16 37.4	9.918
24	10 16 20.92	2.3693	N.12 6 39.6	10.007

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 16 20.92	2.3693	N. 12 6 39.6	10.007
1	10 18 43.08	2.3693	11 56 36.5	10.095
2	10 21 5.24	2.3693	11 46 28.2	10.182
3	10 23 27.40	2.3693	11 36 14.7	10.268
4	10 25 49.56	2.3693	11 25 56.1	10.353
5	10 28 11.72	2.3693	11 15 32.4	10.437
6	10 30 33.88	2.3693	11 5 3.7	10.519
7	10 32 56.04	2.3693	10 54 30.1	10.601
8	10 35 18.20	2.3693	10 43 51.6	10.682
9	10 37 40.36	2.3693	10 33 8.3	10.762
10	10 40 2.52	2.3694	10 22 20.2	10.841
11	10 42 24.69	2.3695	10 11 27.4	10.918
12	10 44 46.86	2.3695	10 0 30.1	10.994
13	10 47 9.03	2.3695	9 49 28.2	11.069
14	10 49 31.20	2.3695	9 38 21.8	11.142
15	10 51 53.37	2.3696	9 27 11.1	11.215
16	10 54 15.55	2.3697	9 15 56.0	11.287
17	10 56 37.73	2.3697	9 4 36.6	11.358
18	10 58 59.91	2.3697	8 53 13.0	11.427
19	11 1 22.10	2.3698	8 41 45.3	11.496
20	11 3 44.29	2.3698	8 30 13.5	11.562
21	11 6 6.48	2.3699	8 18 37.8	11.627
22	11 8 28.68	2.3701	8 6 58.2	11.692
23	11 10 50.89	2.3702	N. 7 55 14.8	11.755

FRIDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 13 13.11	2.3704	N. 7 43 27.6	11.817
1	11 15 35.34	2.3705	7 31 36.7	11.877
2	11 17 57.57	2.3706	7 19 42.3	11.936
3	11 20 19.81	2.3707	7 7 44.4	11.993
4	11 22 42.06	2.3710	6 55 43.1	12.050
5	11 25 4.33	2.3712	6 43 38.4	12.106
6	11 27 26.61	2.3714	6 31 30.4	12.159
7	11 29 48.90	2.3717	6 19 19.3	12.211
8	11 32 11.21	2.3719	6 7 5.1	12.262
9	11 34 33.53	2.3722	5 54 47.9	12.311
10	11 36 55.87	2.3725	5 42 27.8	12.359
11	11 39 18.23	2.3727	5 30 4.8	12.406
12	11 41 40.60	2.3730	5 17 39.1	12.451
13	11 44 2.99	2.3733	5 5 10.7	12.494
14	11 46 25.40	2.3737	4 52 39.8	12.536
15	11 48 47.84	2.3741	4 40 6.4	12.577
16	11 51 10.30	2.3745	4 27 30.5	12.616
17	11 53 32.78	2.3749	4 14 52.4	12.653
18	11 55 55.29	2.3753	4 2 12.1	12.689
19	11 58 17.82	2.3757	3 49 29.7	12.724
20	12 0 40.38	2.3762	3 36 45.2	12.757
21	12 3 2.97	2.3767	3 23 58.8	12.788
22	12 5 25.59	2.3772	3 11 10.6	12.818
23	12 7 48.24	2.3778	2 58 20.6	12.847
24	12 10 10.93	2.3784	N. 2 45 28.9	12.874

SATURDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 10 10.93	2.3784	N. 2 45 28.9	12.874
1	12 12 33.65	2.3789	2 32 35.7	12.899
2	12 14 56.40	2.3795	2 19 41.0	12.922
3	12 17 19.19	2.3802	2 6 45.0	12.944
4	12 19 42.02	2.3808	1 53 47.7	12.965
5	12 22 4.89	2.3814	1 40 49.2	12.983
6	12 24 27.79	2.3821	1 27 49.7	13.000
7	12 26 50.74	2.3828	1 14 49.2	13.016
8	12 29 13.73	2.3836	1 1 47.8	13.030
9	12 31 36.77	2.3843	0 48 45.6	13.042
10	12 33 59.85	2.3851	0 35 42.7	13.052
11	12 36 22.98	2.3858	0 22 39.3	13.061
12	12 38 46.15	2.3866	N. 0 9 35.4	13.068
13	12 41 9.37	2.3875	S. 0 3 28.9	13.073
14	12 43 32.65	2.3884	0 16 33.4	13.077
15	12 45 55.98	2.3893	0 29 38.1	13.079
16	12 48 19.36	2.3902	0 42 42.9	13.080
17	12 50 42.80	2.3911	0 55 47.7	13.078
18	12 53 6.29	2.3920	1 8 52.3	13.075
19	12 55 29.84	2.3930	1 21 56.7	13.071
20	12 57 53.45	2.3940	1 35 0.8	13.064
21	13 0 17.12	2.3950	1 48 4.4	13.056
22	13 2 40.85	2.3960	2 1 7.5	13.047
23	13 5 4.64	2.3970	S. 2 14 10.0	13.035

SUNDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 7 28.49	2.3981	S. 2 27 11.7	13.022
1	13 9 52.41	2.3992	2 40 12.6	13.007
2	13 12 16.39	2.4003	2 53 12.5	12.990
3	13 14 40.44	2.4014	3 6 11.4	12.972
4	13 17 4.56	2.4025	3 19 9.1	12.952
5	13 19 28.74	2.4036	3 32 5.6	12.930
6	13 21 52.99	2.4048	3 45 0.7	12.907
7	13 24 17.31	2.4060	3 57 54.4	12.882
8	13 26 41.71	2.4072	4 10 46.5	12.854
9	13 29 6.18	2.4084	4 23 36.9	12.826
10	13 31 30.72	2.4097	4 36 25.6	12.796
11	13 33 55.34	2.4109	4 49 12.4	12.764
12	13 36 20.03	2.4122	5 1 57.3	12.731
13	13 38 44.80	2.4134	5 14 40.1	12.695
14	13 41 9.64	2.4147	5 27 20.7	12.658
15	13 43 34.56	2.4160	5 39 59.1	12.620
16	13 45 59.56	2.4173	5 52 35.1	12.579
17	13 48 24.64	2.4186	6 5 8.6	12.537
18	13 50 49.79	2.4199	6 17 30.5	12.493
19	13 53 15.03	2.4213	6 30 7.8	12.448
20	13 55 40.35	2.4226	6 42 33.3	12.401
21	13 58 5.74	2.4239	6 54 55.9	12.352
22	14 0 31.21	2.4253	7 7 15.6	12.302
23	14 2 56.77	2.4267	7 19 32.2	12.251
24	14 5 22.41	2.4280	S. 7 31 45.7	12.197

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 5 22.41	2.4280	S. 7 31 45.7	12.197
1	14 7 48.13	2.4293	7 43 55.9	12.142
2	14 10 13.93	2.4307	7 56 2.8	12.086
3	14 12 39.82	2.4322	8 8 6.2	12.027
4	14 15 5.79	2.4336	8 20 6.0	11.967
5	14 17 31.85	2.4349	8 32 2.2	11.906
6	14 19 57.98	2.4362	8 43 54.7	11.843
7	14 22 24.19	2.4376	8 55 43.4	11.778
8	14 24 50.49	2.4390	9 7 28.1	11.712
9	14 27 16.87	2.4403	9 19 8.8	11.644
10	14 29 43.33	2.4417	9 30 45.4	11.576
11	14 32 9.87	2.4431	9 42 17.9	11.506
12	14 34 36.50	2.4445	9 53 46.1	11.433
13	14 37 3.21	2.4458	10 5 9.9	11.360
14	14 39 29.99	2.4470	10 16 29.3	11.285
15	14 41 56.85	2.4483	10 27 44.1	11.208
16	14 44 23.79	2.4497	10 38 54.3	11.131
17	14 46 50.81	2.4510	10 49 59.8	11.052
18	14 49 17.91	2.4522	11 1 0.5	10.971
19	14 51 45.08	2.4535	11 11 56.3	10.889
20	14 54 12.33	2.4548	11 22 47.2	10.806
21	14 56 39.66	2.4561	11 33 33.0	10.720
22	14 59 7.06	2.4573	11 44 13.6	10.634
23	15 1 34.53	2.4584	S. 11 54 49.1	10.547

TUESDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 4 2.07	2.4596	S. 12 5 19.3	10.458
1	15 6 29.68	2.4607	12 15 44.1	10.368
2	15 8 57.36	2.4619	12 26 3.5	10.277
3	15 11 25.11	2.4631	12 36 17.4	10.185
4	15 13 52.93	2.4642	12 46 25.7	10.092
5	15 16 20.81	2.4652	12 56 28.4	9.997
6	15 18 48.75	2.4662	13 6 25.3	9.900
7	15 21 16.76	2.4672	13 16 16.4	9.803
8	15 23 44.82	2.4682	13 26 1.7	9.705
9	15 26 12.94	2.4692	13 35 41.0	9.605
10	15 28 41.12	2.4701	13 45 14.3	9.505
11	15 31 9.35	2.4710	13 54 41.6	9.403
12	15 33 37.64	2.4719	14 4 2.7	9.300
13	15 36 5.98	2.4727	14 13 17.6	9.197
14	15 38 34.37	2.4735	14 22 26.3	9.092
15	15 41 2.80	2.4742	14 31 28.6	8.985
16	15 43 31.27	2.4749	14 40 24.5	8.878
17	15 45 59.79	2.4756	14 49 14.0	8.771
18	15 48 28.35	2.4763	14 57 57.1	8.663
19	15 50 56.95	2.4769	15 6 33.6	8.553
20	15 53 25.58	2.4774	15 15 3.4	8.442
21	15 55 54.24	2.4779	15 23 26.6	8.330
22	15 58 22.93	2.4784	15 31 43.0	8.218
23	16 0 51.65	2.4788	15 39 52.7	8.105
24	16 3 20.39	2.4792	S. 15 47 55.6	7.991

WEDNESDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 3 20.39	2.4792	S. 15 47 55.6	7.991
1	16 5 49.16	2.4796	15 55 51.6	7.876
2	16 8 17.94	2.4799	16 3 40.7	7.761
3	16 10 46.74	2.4801	16 11 22.9	7.645
4	16 13 15.55	2.4802	16 18 58.1	7.527
5	16 15 44.37	2.4804	16 26 26.2	7.409
6	16 18 13.20	2.4806	16 33 47.2	7.291
7	16 20 42.04	2.4806	16 41 1.1	7.172
8	16 23 10.87	2.4805	16 48 7.8	7.052
9	16 25 39.70	2.4805	16 55 7.3	6.932
10	16 28 8.53	2.4803	17 1 59.6	6.812
11	16 30 37.34	2.4801	17 8 44.7	6.691
12	16 33 6.14	2.4798	17 15 22.5	6.568
13	16 35 34.92	2.4796	17 21 52.9	6.445
14	16 38 3.69	2.4793	17 28 15.9	6.322
15	16 40 32.44	2.4789	17 34 31.6	6.199
16	16 43 1.16	2.4784	17 40 39.8	6.075
17	16 45 29.85	2.4779	17 46 40.6	5.952
18	16 47 58.51	2.4773	17 52 34.0	5.827
19	16 50 27.13	2.4767	17 58 19.9	5.702
20	16 52 55.71	2.4760	18 3 58.2	5.576
21	16 55 24.25	2.4752	18 9 29.0	5.450
22	16 57 52.74	2.4743	18 14 52.2	5.324
23	17 0 21.17	2.4734	S. 18 20 7.9	5.198

THURSDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 2 49.55	2.4725	S. 18 25 16.0	5.072
1	17 5 17.87	2.4715	18 30 16.5	4.945
2	17 7 46.13	2.4705	18 35 9.4	4.817
3	17 10 14.33	2.4694	18 39 54.6	4.690
4	17 12 42.46	2.4682	18 44 32.2	4.563
5	17 15 10.51	2.4669	18 49 2.2	4.436
6	17 17 38.48	2.4655	18 53 24.5	4.308
7	17 20 6.37	2.4642	18 57 39.2	4.181
8	17 22 34.18	2.4628	19 1 46.2	4.053
9	17 25 1.90	2.4612	19 5 45.5	3.925
10	17 27 29.52	2.4596	19 9 37.2	3.797
11	17 29 57.05	2.4580	19 13 21.2	3.669
12	17 32 24.48	2.4562	19 16 57.5	3.541
13	17 34 51.80	2.4544	19 20 26.1	3.413
14	17 37 19.01	2.4526	19 23 47.1	3.286
15	17 39 46.12	2.4508	19 27 0.4	3.158
16	17 42 13.11	2.4488	19 30 6.1	3.031
17	17 44 39.98	2.4467	19 33 4.1	2.903
18	17 47 6.72	2.4447	19 35 54.4	2.775
19	17 49 33.34	2.4426	19 38 37.1	2.648
20	17 51 59.83	2.4403	19 41 12.2	2.521
21	17 54 26.18	2.4380	19 43 39.6	2.394
22	17 56 52.39	2.4357	19 45 59.4	2.267
23	17 59 18.46	2.4333	19 48 11.6	2.140
24	18 1 44.39	2.4309	S. 19 50 16.2	2.014

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 1 44.39	2.4309	S. 19 50 16.2	2.014
1	18 4 10.17	2.4284	19 52 13.3	1.888
2	18 6 35.79	2.4258	19 54 2.8	1.762
3	18 9 1.26	2.4232	19 55 44.7	1.636
4	18 11 26.57	2.4205	19 57 19.1	1.511
5	18 13 51.72	2.4177	19 58 46.1	1.387
6	18 16 16.70	2.4149	20 0 5.6	1.262
7	18 18 41.51	2.4120	20 1 17.6	1.138
8	18 21 6.14	2.4091	20 2 22.2	1.015
9	18 23 30.60	2.4062	20 3 19.4	0.892
10	18 25 54.88	2.4032	20 4 9.2	0.768
11	18 28 18.98	2.4001	20 4 51.6	0.645
12	18 30 42.89	2.3969	20 5 26.6	0.523
13	18 33 6.61	2.3937	20 5 54.3	0.402
14	18 35 30.14	2.3905	20 6 14.8	0.281
15	18 37 53.47	2.3872	20 6 28.0	0.160
16	18 40 16.60	2.3838	20 6 34.0	−0.040
17	18 42 39.53	2.3805	20 6 32.8	+0.080
18	18 45 2.26	2.3771	20 6 24.4	0.199
19	18 47 24.78	2.3736	20 6 8.9	0.317
20	18 49 47.09	2.3700	20 5 46.3	0.436
21	18 52 9.18	2.3664	20 5 16.6	0.554
22	18 54 31.06	2.3628	20 4 39.8	0.671
23	18 56 52.72	2.3592	S. 20 3 56.1	0.787

SATURDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 59 14.17	2.3556	S. 20 3 5.4	0.903
1	19 1 35.40	2.3518	20 2 7.7	1.018
2	19 3 56.39	2.3479	20 1 3.2	1.133
3	19 6 17.15	2.3441	19 59 51.8	1.247
4	19 8 37.68	2.3402	19 58 33.6	1.360
5	19 10 57.98	2.3364	19 57 8.6	1.473
6	19 13 18.05	2.3325	19 55 36.8	1.586
7	19 15 37.88	2.3285	19 53 58.3	1.697
8	19 17 57.47	2.3245	19 52 13.2	1.808
9	19 20 16.82	2.3205	19 50 21.4	1.918
10	19 22 35.93	2.3164	19 48 23.0	2.027
11	19 24 54.79	2.3123	19 46 18.1	2.137
12	19 27 13.40	2.3082	19 44 6.6	2.246
13	19 29 31.77	2.3041	19 41 48.6	2.353
14	19 31 49.89	2.2998	19 39 24.3	2.459
15	19 34 7.75	2.2956	19 36 53.6	2.565
16	19 36 25.36	2.2914	19 34 16.5	2.670
17	19 38 42.72	2.2872	19 31 33.2	2.774
18	19 40 59.83	2.2830	19 28 43.6	2.878
19	19 43 16.68	2.2787	19 25 47.8	2.982
20	19 45 33.27	2.2743	19 22 45.8	3.084
21	19 47 49.60	2.2700	19 19 37.7	3.185
22	19 50 5.67	2.2657	19 16 23.6	3.286
23	19 52 21.48	2.2613	19 13 3.4	3.387
24	19 54 37.02	2.2569	S. 19 9 37.2	3.486

SUNDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 54 37.02	2.2569	S. 19 9 37.2	3.486
1	19 56 52.30	2.2525	19 6 5.1	3.584
2	19 59 7.32	2.2481	19 2 27.1	3.682
3	20 1 22.07	2.2437	18 58 43.2	3.780
4	20 3 36.56	2.2392	18 54 53.5	3.876
5	20 5 50.78	2.2348	18 50 58.1	3.971
6	20 8 4.74	2.2304	18 46 57.0	4.066
7	20 10 18.43	2.2259	18 42 50.2	4.160
8	20 12 31.85	2.2214	18 38 37.8	4.253
9	20 14 45.00	2.2169	18 34 19.8	4.346
10	20 16 57.88	2.2125	18 29 56.2	4.438
11	20 19 10.50	2.2080	18 25 27.2	4.528
12	20 21 22.84	2.2034	18 20 52.8	4.618
13	20 23 34.91	2.1990	18 16 13.0	4.707
14	20 25 46.72	2.1946	18 11 27.9	4.796
15	20 27 58.26	2.1901	18 6 37.5	4.884
16	20 30 9.53	2.1857	18 1 41.8	4.972
17	20 32 20.54	2.1812	17 56 40.9	5.058
18	20 34 31.27	2.1766	17 51 34.9	5.143
19	20 36 41.73	2.1721	17 46 23.8	5.227
20	20 38 51.93	2.1677	17 41 7.7	5.311
21	20 41 1.86	2.1632	17 35 46.5	5.394
22	20 43 11.52	2.1588	17 30 20.4	5.476
23	20 45 20.92	2.1544	S. 17 24 49.4	5.557

MONDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	20 47 30.05	2.1499	S. 17 19 13.5	5.638
1	20 49 38.91	2.1455	17 13 32.8	5.718
2	20 51 47.51	2.1412	17 7 47.4	5.797
3	20 53 55.85	2.1368	17 1 57.2	5.876
4	20 56 3.93	2.1324	16 56 2.3	5.953
5	20 58 11.74	2.1280	16 50 2.8	6.029
6	21 0 19.29	2.1237	16 43 58.8	6.105
7	21 2 26.58	2.1194	16 37 50.2	6.180
8	21 4 33.61	2.1151	16 31 37.2	6.254
9	21 6 40.39	2.1108	16 25 19.7	6.328
10	21 8 46.91	2.1065	16 18 57.8	6.401
11	21 10 53.17	2.1022	16 12 31.6	6.473
12	21 12 59.17	2.0979	16 6 1.0	6.545
13	21 15 4.92	2.0937	15 59 26.2	6.615
14	21 17 10.42	2.0895	15 52 47.2	6.685
15	21 19 15.66	2.0853	15 46 4.0	6.754
16	21 21 20.66	2.0812	15 39 16.7	6.822
17	21 23 25.41	2.0771	15 32 25.4	6.889
18	21 25 29.91	2.0730	15 25 30.1	6.955
19	21 27 34.17	2.0689	15 18 30.8	7.022
20	21 29 38.18	2.0648	15 11 27.5	7.088
21	21 31 41.94	2.0607	15 4 20.3	7.152
22	21 33 45.46	2.0567	14 57 9.3	7.215
23	21 35 48.75	2.0528	14 49 54.5	7.277
24	21 37 51.80	2.0488	S. 14 42 36.0	7.339

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 25.					THURSDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 37 51.80	2.0488	S. 14 42 36.0	7.339	0	23 12 17.98	1.9008	S. 7 52 13.9	9.498
1	21 39 54.61	2.0449	14 35 13.8	7.401	1	23 14 11.96	1.8987	7 42 43.1	9.527
2	21 41 57.19	2.0410	14 27 47.9	7.462	2	23 16 5.82	1.8967	7 33 10.7	9.554
3	21 43 59.53	2.0371	14 20 18.3	7.522	3	23 17 59.56	1.8947	7 23 36.6	9.581
4	21 46 1.64	2.0333	14 12 45.2	7.581	4	23 19 53.18	1.8927	7 14 0.9	9.608
5	21 48 3.53	2.0296	14 5 8.6	7.639	5	23 21 46.68	1.8907	7 4 23.6	9.635
6	21 50 5.19	2.0258	13 57 28.5	7.697	6	23 23 40.06	1.8888	6 54 44.7	9.661
7	21 52 6.62	2.0220	13 49 44.9	7.754	7	23 25 33.33	1.8870	6 45 4.3	9.686
8	21 54 7.83	2.0183	13 41 58.0	7.810	8	23 27 26.50	1.8852	6 35 22.4	9.710
9	21 56 8.82	2.0147	13 34 7.7	7.866	9	23 29 19.56	1.8834	6 25 39.1	9.733
10	21 58 9.59	2.0110	13 26 14.1	7.921	10	23 31 12.51	1.8818	6 15 54.4	9.757
11	22 0 10.14	2.0073	13 18 17.2	7.975	11	23 33 5.37	1.8802	6 6 8.3	9.780
12	22 2 10.47	2.0037	13 10 17.1	8.028	12	23 34 58.13	1.8786	5 56 20.8	9.802
13	22 4 10.59	2.0002	13 2 13.8	8.081	13	23 36 50.80	1.8770	5 46 32.0	9.823
14	22 6 10.50	1.9967	12 54 7.4	8.133	14	23 38 43.37	1.8754	5 36 42.0	9.843
15	22 8 10.20	1.9932	12 45 57.9	8.184	15	23 40 35.85	1.8739	5 26 50.8	9.863
16	22 10 9.69	1.9898	12 37 45.3	8.235	16	23 42 28.24	1.8725	5 16 58.4	9.883
17	22 12 8.98	1.9865	12 29 29.7	8.265	17	23 44 20.55	1.8712	5 7 4.8	9.902
18	22 14 8.07	1.9832	12 21 11.1	8.334	18	23 46 12.78	1.8698	4 57 10.1	9.921
19	22 16 6.96	1.9798	12 12 49.6	8.382	19	23 48 4.93	1.8685	4 47 14.3	9.939
20	22 18 5.65	1.9765	12 4 25.2	8.430	20	23 49 57.00	1.8673	4 37 17.4	9.957
21	22 20 4.14	1.9733	11 55 58.0	8.477	21	23 51 49.00	1.8661	4 27 19.5	9.973
22	22 22 2.44	1.9701	11 47 27.9	8.524	22	23 53 40.93	1.8649	4 17 20.7	9.988
23	22 24 0.55	1.9669	S. 11 38 55.1	8.569	23	23 55 32.79	1.8638	S. 4 7 21.0	10.003
	WEDNESDAY 26.					FRIDAY 28.			
0	22 25 58.46	1.9637	S. 11 30 19.6	8.614	0	23 57 24.58	1.8627	S. 3 57 20.4	10.018
1	22 27 56.19	1.9606	11 21 41.4	8.658	1	23 59 16.31	1.8617	3 47 18.9	10.032
2	22 29 53.74	1.9576	11 13 0.6	8.702	2	0 1 7.98	1.8607	3 37 16.6	10.046
3	22 31 51.10	1.9545	11 4 17.2	8.745	3	0 2 59.59	1.8597	3 27 13.4	10.059
4	22 33 48.28	1.9516	10 55 31.2	8.788	4	0 4 51.15	1.8588	3 17 9.5	10.071
5	22 35 45.29	1.9487	10 46 42.6	8.831	5	0 6 42.65	1.8579	3 7 4.9	10.083
6	22 37 42.12	1.9457	10 37 51.5	8.872	6	0 8 34.10	1.8572	2 56 59.6	10.094
7	22 39 38.77	1.9429	10 28 58.0	8.911	7	0 10 25.51	1.8564	2 46 53.6	10.105
8	22 41 35.26	1.9401	10 20 2.2	8.950	8	0 12 16.87	1.8557	2 36 47.0	10.114
9	22 43 31.58	1.9373	10 11 4.0	8.989	9	0 14 8.19	1.8550	2 26 39.9	10.123
10	22 45 27.74	1.9346	10 2 3.5	9.028	10	0 15 59.47	1.8544	2 16 32.2	10.132
11	22 47 23.73	1.9319	9 53 0.7	9.066	11	0 17 50.72	1.8538	2 6 24.0	10.140
12	22 49 19.56	1.9292	9 43 55.6	9.103	12	0 19 41.93	1.8532	1 56 15.4	10.148
13	22 51 15.23	1.9266	9 34 48.4	9.139	13	0 21 33.11	1.8527	1 46 6.3	10.155
14	22 53 10.75	1.9241	9 25 39.0	9.175	14	0 23 24.26	1.8523	1 35 56.8	10.161
15	22 55 6.12	1.9216	9 16 27.4	9.211	15	0 25 15.39	1.8520	1 25 47.0	10.166
16	22 57 1.34	1.9191	9 7 13.7	9.245	16	0 27 6.50	1.8516	1 15 36.9	10.171
17	22 58 56.41	1.9166	8 57 58.0	9.278	17	0 28 57.58	1.8512	1 5 26.5	10.176
18	23 0 51.33	1.9142	8 48 40.3	9.311	18	0 30 48.64	1.8509	0 55 15.8	10.180
19	23 2 46.11	1.9118	8 39 20.6	9.344	19	0 32 39.69	1.8507	0 45 4.9	10.183
20	23 4 40.75	1.9096	8 29 59.0	9.376	20	0 34 30.73	1.8505	0 34 53.8	10.186
21	23 6 35.26	1.9073	8 20 35.5	9.407	21	0 36 21.75	1.8503	0 24 42.6	10.188
22	23 8 29.63	1.9051	8 11 10.1	9.438	22	0 38 12.77	1.8503	0 14 31.3	10.189
23	23 10 23.87	1.9029	8 1 42.9	9.468	23	0 40 3.79	1.8502	S. 0 4 19.9	10.191
24	23 12 17.98	1.9008	S. 7 52 13.9	9.498	24	0 41 54.80	1.8502	N. 0 5 51.6	10.192

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 41 54.80	1.8502	N. 0 5 51.6	10.192
1	0 43 45.81	1.8502	0 16 3.1	10.191
2	0 45 36.83	1.8503	0 26 14.5	10.189
3	0 47 27.85	1.8504	0 36 25.8	10.188
4	0 49 18.88	1.8506	0 46 37.0	10.186
5	0 51 9.92	1.8508	0 56 48.1	10.183
6	0 53 0.97	1.8510	1 6 59.0	10.180
7	0 54 52.04	1.8513	1 17 9.7	10.176
8	0 56 43.13	1.8517	1 27 20.1	10.171
9	0 58 34.24	1.8520	1 37 30.2	10.166
10	1 0 25.37	1.8524	1 47 40.0	10.160
11	1 2 16.53	1.8528	1 57 49.4	10.154
12	1 4 7.71	1.8533	2 7 58.5	10.147
13	1 5 58.93	1.8539	2 18 7.1	10.139
14	1 7 50.18	1.8544	2 28 15.2	10.131
15	1 9 41.46	1.8550	2 38 22.8	10.122
16	1 11 32.78	1.8557	2 48 29.8	10.113
17	1 13 24.15	1.8565	2 58 36.3	10.103
18	1 15 15.56	1.8572	3 8 42.2	10.092
19	1 17 7.02	1.8580	3 18 47.4	10.081
20	1 18 58.52	1.8588	3 28 51.9	10.069
21	1 20 50.07	1.8597	3 38 55.7	10.057
22	1 22 41.68	1.8606	3 48 58.7	10.043
23	1 24 33.34	1.8615	N. 3 59 0.9	10.029

SUNDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 26 25.06	1.8625	N. 4 9 2.2	10.014
1	1 28 16.84	1.8635	4 19 2.6	9.999
2	1 30 8.68	1.8646	4 29 2.1	9.984
3	1 32 0.59	1.8657	4 39 0.7	9.968
4	1 33 52.56	1.8669	4 48 58.3	9.951
5	1 35 44.61	1.8681	4 58 54.8	9.934
6	1 37 36.73	1.8693	5 8 50.3	9.916
7	1 39 28.92	1.8705	5 18 44.7	9.897
8	1 41 21.19	1.8718	5 28 37.9	9.877
9	1 43 13.54	1.8732	5 38 29.9	9.857
10	1 45 5.97	1.8746	5 48 20.7	9.836
11	1 46 58.49	1.8760	5 58 10.2	9.814
12	1 48 51.09	1.8774	6 7 58.4	9.792
13	1 50 43.78	1.8789	6 17 45.3	9.770
14	1 52 36.56	1.8804	6 27 30.8	9.747
15	1 54 29.43	1.8820	6 37 14.9	9.722
16	1 56 22.40	1.8836	6 46 57.5	9.697
17	1 58 15.46	1.8852	6 56 38.6	9.672
18	2 0 8.62	1.8868	7 6 18.2	9.647
19	2 2 1.88	1.8886	7 15 56.2	9.620
20	2 3 55.25	1.8903	7 25 32.6	9.593
21	2 5 48.72	1.8921	7 35 7.4	9.566
22	2 7 42.30	1.8939	7 44 40.5	9.537
23	2 9 35.99	1.8958	7 54 11.8	9.508
24	2 11 29.79	1.8977	N. 8 3 41.4	9.478

MONDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 11 29.79	1.8977	N. 8 3 41.4	9.478
1	2 13 23.71	1.8996	8 13 9.2	9.447
2	2 15 17.74	1.9015	8 22 35.1	9.416
3	2 17 11.89	1.9035	8 31 59.1	9.384
4	2 19 6.16	1.9055	8 41 21.2	9.352
5	2 21 0.55	1.9075	8 50 41.3	9.319
6	2 22 55.06	1.9096	8 59 59.4	9.285
7	2 24 49.70	1.9117	9 9 15.5	9.251
8	2 26 44.47	1.9138	9 18 29.5	9.215
9	2 28 39.36	1.9160	9 27 41.3	9.178
10	2 30 34.39	1.9182	9 36 50.9	9.142
11	2 32 29.55	1.9205	9 45 58.3	9.105
12	2 34 24.85	1.9228	9 55 3.5	9.067
13	2 36 20.29	1.9251	10 4 6.4	9.029
14	2 38 15.86	1.9274	10 13 7.0	8.990
15	2 40 11.57	1.9298	10 22 5.2	8.950
16	2 42 7.43	1.9322	10 31 1.0	8.909
17	2 44 3.43	1.9345	10 39 54.3	8.868
18	2 45 59.57	1.9369	10 48 45.2	8.827
19	2 47 55.86	1.9394	10 57 33.6	8.785
20	2 49 52.30	1.9419	11 6 19.4	8.741
21	2 51 48.89	1.9444	11 15 2.5	8.696
22	2 53 45.63	1.9470	11 23 42.9	8.652
23	2 55 42.53	1.9496	N.11 32 20.7	8.607

TUESDAY, NOVEMBER 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	2 57 39.58	1.9522	N.11 40 55.8	8.562

PHASES OF THE MOON.

		d	h	m
○ Full Moon . .	Oct.	1	15	47.3
☾ Last Quarter. . . .		9	16	57.2
● New Moon		16	10	35.0
☽ First Quarter . . .		23	5	45.8
○ Full Moon		31	9	30.8

		d	h
☾ Apogee. . . .	Oct.	2	10.7
☾ Perigee.		16	5.8
☾ Apogee.		29	11.2

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	α Aquilæ	W.	66° 36′ 10″	3691	67° 53′ 7″	3680	69° 10′ 15″	3671	70° 27′ 33″	3662
	Fomalhaut	W.	32 53 1	4085	34 3 17	4010	35 14 47	3944	36 27 22	3886
	Aldebaran	E.	67 11 12	3059	65 42 12	3060	64 13 14	3062	62 44 18	3065
2	α Aquilæ	W.	76 56 20	3625	78 14 27	3621	79 32 39	3616	80 50 56	3612
	Fomalhaut	W.	42 43 16	3674	44 0 31	3643	45 18 19	3614	46 36 38	3589
	α Pegasi	W.	31 11 39	4651	32 13 20	4526	33 16 49	4415	34 21 57	4316
	Aldebaran	E.	55 20 8	3070	53 51 22	3071	52 22 37	3072	50 53 53	3072
	Pollux	E.	99 22 58	3124	97 55 17	3124	96 27 37	3124	94 59 57	3124
3	Fomalhaut	W.	53 14 27	3488	54 35 4	3473	55 55 58	3458	57 17 9	3445
	α Pegasi	W.	40 7 32	3959	41 19 52	3908	42 33 4	3861	43 47 3	3819
	Aldebaran	E.	43 30 15	3072	42 1 31	3071	40 32 46	3071	39 4 1	3060
	Pollux	E.	87 41 37	3124	86 13 56	3123	84 46 14	3123	83 18 32	3122
.4	Fomalhaut	W.	64 6 39	3386	65 29 11	3376	66 51 55	3366	68 14 50	3357
	α Pegasi	W.	50 6 54	3652	51 24 32	3625	52 42 39	3600	54 1 13	3578
	Aldebaran	E.	31 39 48	3061	30 10 51	3059	28 41 51	3057	27 12 49	3054
	Pollux	E.	75 59 43	3116	74 31 53	3114	73 4 1	3113	71 36 7	3110
5	Fomalhaut	W.	75 11 57	3315	76 35 51	3307	77 59 54	3300	79 24 6	3292
	α Pegasi	W.	60 39 48	3481	62 0 33	3465	63 21 36	3450	64 42 56	3434
	Pollux	E.	64 15 59	3100	62 47 49	3097	61 19 36	3095	59 51 20	3091
	SATURN	E.	76 33 29	3063	75 4 34	3059	73 35 34	3054	72 6 28	3049
	MARS	E.	96 18 14	3261	94 53 17	3257	93 28 15	3252	92 3 7	3247
	Regulus	E.	99 54 10	3034	98 24 40	3030	96 55 5	3026	95 25 25	3021
6	Fomalhaut	W.	86 27 17	3255	87 52 21	3247	89 17 34	3241	90 42 55	3234
	α Pegasi	W.	71 33 46	3366	72 56 41	3353	74 19 51	3340	75 43 16	3328
	α Arietis	W.	28 25 33	3713	29 42 6	3642	30 59 55	3579	32 18 52	3524
	Pollux	E.	52 29 6	3077	51 0 28	3074	49 31 47	3071	48 3 2	3069
	SATURN	E.	64 39 20	3019	63 9 31	3013	61 39 34	3006	60 9 29	2999
	MARS	E.	84 55 49	3216	83 29 59	3209	82 4 1	3202	80 37 54	3193
	Regulus	E.	87 55 23	2992	86 25 0	2985	84 54 29	2979	83 23 50	2972
	VENUS	E.	109 51 40	2973	108 20 54	2967	106 50 0	2961	105 18 58	2954
	SUN	E.	132 19 35	3384	130 57 0	3376	129 34 16	3367	128 11 22	3358
7	α Pegasi	W.	82 43 45	3270	84 8 31	3259	85 33 30	3248	86 58 42	3238
	α Arietis	W.	39 7 12	3314	40 31 7	3282	41 55 40	3252	43 20 48	3223
	Pollux	E.	40 38 30	3058	39 9 29	3057	37 40 27	3057	36 11 25	3059
	SATURN	E.	52 36 37	2957	51 5 30	2947	49 34 11	2938	48 2 40	2928
	MARS	E.	73 24 50	3150	71 57 41	3140	70 30 20	3130	69 2 47	3119
	Regulus	E.	75 48 6	2930	74 16 25	2920	72 44 32	2911	71 12 27	2901
	VENUS	E.	97 41 29	2915	96 9 29	2907	94 37 19	2898	93 4 58	2889
	SUN	E.	121 14 17	3312	119 50 19	3300	118 26 8	3290	117 1 45	3279
8	α Arietis	W.	50 34 32	3097	52 2 45	3074	53 31 26	3052	55 0 34	3030
	Aldebaran	W.	16 40 35	2849	18 13 59	2837	19 47 39	2824	21 21 36	2810
	SATURN	E.	40 21 47	2873	38 48 53	2860	37 15 43	2848	35 42 18	2835
	MARS	E.	61 41 39	3061	60 12 42	3048	58 43 29	3035	57 14 0	3022
	Regulus	E.	63 28 41	2845	61 55 12	2834	60 21 28	2821	58 47 27	2808
	VENUS	E.	85 20 13	2841	83 46 38	2830	82 12 49	2819	80 38 46	2808

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	α Aquilæ	W.	71° 45′ 1″	3652	73° 2′ 39″	3645	74° 20′ 25″	3637	75° 38′ 19″	3631
	Fomalhaut	W.	37 40 56	3834	38 55 23	3788	40 10 38	3746	41 26 37	3708
	Aldebaran	E.	61 15 25	3066	59 46 34	3067	58 17 44	3068	56 48 55	3069
2	α Aquilæ	W.	82 9 17	3609	83 27 42	3606	84 46 10	3602	86 4 42	3600
	Fomalhaut	W.	47 55 24	3565	49 14 36	3544	50 34 12	3525	51 54 9	3506
	α Pegasi	W.	35 28 35	4229	36 36 34	4150	37 45 48	4080	38 56 9	4017
	Aldebaran	E.	49 25 9	3072	47 56 25	3072	46 27 41	3073	44 58 58	3073
	Pollux	E.	93 32 17	3124	92 4 37	3124	90 36 57	3124	89 9 17	3124
3	Fomalhaut	W.	58 38 35	3431	60 0 16	3419	61 22 11	3408	62 44 19	3397
	α Pegasi	W.	45 1 46	3780	46 17 9	3744	47 33 10	3710	48 49 46	3680
	Aldebaran	E.	37 35 14	3068	36 6 25	3067	34 37 35	3065	33 8 43	3063
	Pollux	E.	81 50 49	3121	80 23 5	3119	78 55 19	3119	77 27 32	3117
4	Fomalhaut	W.	69 37 56	3348	71 1 12	3340	72 24 37	3332	73 48 12	3323
	α Pegasi	W.	55 20 11	3556	56 39 33	3536	57 59 17	3517	59 19 22	3498
	Aldebaran	E.	25 43 43	3051	24 14 33	3048	22 45 20	3045	21 16 3	3042
	Pollux	E.	70 8 10	3109	68 40 11	3107	67 12 10	3105	65 44 6	3102
5	Fomalhaut	W.	80 48 27	3284	82 12 57	3277	83 37 35	3270	85 2 22	3263
	α Pegasi	W.	66 4 34	3420	67 26 28	3405	68 48 39	3392	70 11 5	3379
	Pollux	E.	58 23 0	3089	56 54 37	3086	55 26 10	3083	53 57 40	3080
	SATURN	E.	70 37 16	3043	69 7 57	3039	67 38 32	3033	66 9 0	3026
	MARS	E.	90 37 53	3241	89 12 32	3236	87 47 5	3230	86 21 31	3223
	Regulus	E.	93 55 38	3016	92 25 45	3010	90 55 45	3005	89 25 38	2998
6	Fomalhaut	W.	92 8 24	3226	93 34 2	3220	94 59 48	3212	96 25 43	3205
	α Pegasi	W.	77 6 55	3317	78 30 47	3305	79 54 53	3294	81 19 12	3282
	α Arietis	W.	33 38 50	3474	34 59 43	3429	36 21 27	3387	37 43 58	3350
	Pollux	E.	46 34 14	3066	45 5 23	3063	43 36 28	3060	42 7 30	3059
	SATURN	E.	58 39 15	2991	57 8 51	2983	55 38 17	2974	54 7 32	2966
	MARS	E.	79 11 37	3186	77 45 11	3178	76 18 35	3168	74 51 48	3159
	Regulus	E.	81 53 2	2964	80 22 4	2955	78 50 55	2947	77 19 36	2939
	VENUS	E.	103 47 47	2946	102 16 27	2939	100 44 57	2931	99 13 18	2924
	SUN	E.	126 48 18	3349	125 25 3	3340	124 1 38	3332	122 38 3	3322
7	α Pegasi	W.	88 24 6	3227	89 49 43	3216	91 15 33	3205	92 41 36	3195
	α Arietis	W.	44 46 30	3195	46 12 45	3169	47 39 31	3144	49 6 47	3120
	Pollux	E.	34 42 25	3061	33 13 28	3065	31 44 36	3070	30 15 50	3078
	SATURN	E.	46 30 57	2918	44 59 1	2907	43 26 51	2895	41 54 26	2884
	MARS	E.	67 35 1	3109	66 7 2	3097	64 38 49	3085	63 10 21	3073
	Regulus	E.	69 40 9	2891	68 7 38	2880	66 34 53	2869	65 1 54	2858
	VENUS	E.	91 32 25	2880	89 59 41	2870	88 26 44	2861	86 53 35	2851
	SUN	E.	115 37 9	3268	114 12 20	3256	112 47 17	3243	111 21 59	3231
8	α Arietis	W.	56 30 9	3009	58 0 10	2989	59 30 36	2969	61 1 28	2949
	Aldebaran	W.	22 55 51	2797	24 30 23	2784	26 5 12	2769	27 40 20	2755
	SATURN	E.	34 8 36	2822	32 34 37	2809	31 0 21	2796	29 25 48	2782
	MARS	E.	55 44 14	3008	54 14 11	2994	52 43 51	2980	51 13 13	2965
	Regulus	E.	57 13 10	2795	55 38 36	2782	54 3 44	2768	52 28 34	2754
	VENUS	E.	79 4 29	2797	77 29 57	2785	75 55 10	2774	74 20 8	2762

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
8	SUN	E.	109° 56′ 26″	3218	108° 30′ 38″	3205	107° 4′ 35″	3191	105° 38′ 15″	3178
9	α Arietis	W.	62 32 45	2929	64 4 27	2909	65 36 34	2889	67 9 7	2869
	Aldebaran	W.	29 15 47	2741	30 51 33	2725	32 27 39	2710	34 4 5	2695
	SATURN	E.	27 50 57	2768	26 15 47	2754	24 40 19	2740	23 4 32	2725
	MARS	E.	49 42 16	2950	48 11 0	2934	46 39 24	2918	45 7 28	2902
	Regulus	E.	50 53 6	2740	49 17 19	2725	47 41 12	2710	46 4 45	2695
	VENUS	E.	72 44 50	2750	71 9 16	2737	69 33 25	2724	67 57 17	2711
	SUN	E.	98 22 18	3103	96 54 12	3087	95 25 46	3070	93 57 0	3054
10	α Arietis	W.	74 58 6	2773	76 33 9	2755	78 8 36	2736	79 44 28	2716
	Aldebaran	W.	42 11 30	2615	43 50 5	2598	45 29 3	2580	47 8 25	2563
	MARS	E.	37 22 32	2818	35 48 27	2799	34 13 58	2782	32 39 6	2763
	Regulus	E.	37 57 16	2614	36 18 40	2598	34 39 42	2580	33 0 20	2563
	VENUS	E.	59 52 15	2645.	58 14 21	2631	56 36 8	2618	54 57 37	2604
	SUN	E.	86 27 57	2967	84 57 3	2950	83 25 47	2931	81 54 7	2912
11	α Arietis	W.	87 50 8	2624	89 28 31	2606	91 7 18	2588	92 46 30	2570
	Aldebaran	W.	55 31 18	2475	57 13 7	2456	58 55 22	2438	60 38 3	2420
	VENUS	E.	46 40 24	2538	45 0 4	2525	43 19 26	2514	41 38 32	2502
	SUN	E.	74 9 52	2818	72 35 47	2799	71 1 18	2780	69 26 24	2760
12	Aldebaran	W.	69 17 54	2329	71 3 11	2311	72 48 54	2294	74 35 3	2277
	Pollux	W.	26 32 14	2587	28 11 27	2540	29 51 44	2499	31 32 59	2461
	VENUS	E.	33 10 34	2463	31 28 29	2460	29 46 20	2460	28 4 10	2463
	SUN	E.	61 25 33	2666	59 48 7	2647	58 10 16	2629	56 32 0	2611
13	Aldebaran	W.	83 32 10	2191	85 20 51	2175	87 9 56	2160	88 59 24	2144
	Pollux	W.	40 11 10	2313	41 56 51	2289	43 43 7	2266	45 29 57	2243
	SUN	E.	48 14 39	2525	46 34 1	2510	44 53 2	2494	43 11 41	2480
14	Aldebaran	W.	98 12 22	2075	100 4 0	2062	101 55 57	2050	103 48 13	2039
	Pollux	W.	54 31 43	2151	56 21 25	2135	58 11 31	2120	60 1 59	2107
	SUN	E.	34 40 15	2420	32 57 9	2412	31 13 51	2405	29 30 23	2399
18	SUN	W.	22 45 19	2429	24 28 13	2430	26 11 5	2433	27 53 52	2439
	α Aquilæ	E.	72 52 30	2636	71 14 24	2661	69 36 52	2688	67 59 56	2718
	Fomalhaut	E.	106 2 16	2320	104 16 46	2328	102 31 27	2336	100 46 20	2345
19	SUN	W.	36 24 53	2493	38 6 16	2507	39 47 20	2522	41 28 3	2537
	α Aquilæ	E.	60 6 5	2903	58 33 50	2950	57 2 34	2999	55 32 20	3052
	Fomalhaut	E.	92 4 35	2408	90 21 11	2423	88 38 9	2439	86 55 30	2457
20	SUN	W.	49 46 0	2624	51 24 23	2642	53 2 21	2660	54 39 54	2680
	α Aquilæ	E.	48 19 3	3387	46 56 32	3472	45 35 37	3565	44 16 24	3665
	Fomalhaut	E.	78 28 45	2556	76 48 49	2577	75 9 23	2601	73 30 29	2624
	α Pegasi	E.	93 43 48	2621	92 5 21	2638	90 27 18	2657	88 49 40	2675
21	SUN	W.	62 41 10	2778	64 16 7	2798	65 50 38	2818	67 24 43	2838
	Antares	W.	23 39 28	2785	25 14 15	2761	26 49 34	2745	28 25 14	2735
	Fomalhaut	E.	65 24 16	2753	63 48 47	2782	62 13 56	2811	60 39 43	2842
	α Pegasi	E.	80 48 6	2780	79 13 12	2803	77 38 48	2826	76 4 54	2851

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
8	**Sun**	E.	104° 11′ 39″	3163	102° 44′ 46″	3148	101° 17′ 35″	3133	99° 50′ 6″	3118
9	α Arietis	W.	68 42 5	2850	70 15 28	2831	71 49 16	2812	73 23 28	2792
	Aldebaran	W.	35 40 51	2680	37 17 58	2663	38 55 27	2648	40 33 17	2631
	Saturn	E.	21 28 25	2710	19 51 59	2696	18 15 14	2682	16 38 10	2668
	Mars	E.	43 35 12	2886	42 2 35	2869	40 29 36	2852	38 56 15	2835
	Regulus	E.	44 27 58	2679	42 50 50	2663	41 13 20	2647	39 35 29	2631
	Venus	E.	66 20 52	2698	64 44 9	2685	63 7 9	2672	61 29 51	2658
	Sun	E.	92 27 54	3037	90 58 27	3020	89 28 39	3002	87 58 29	2985
10	α Arietis	W.	81 20 46	2698	82 57 29	2679	84 34 37	2660	86 12 10	2642
	Aldebaran	W.	48 48 11	2545	50 28 21	2528	52 8 55	2510	53 49 54	2492
	Mars	E.	31 3 50	2745	29 28 10	2727	27 52 6	2708	26 15 37	2689
	Regulus	E.	31 20 34	2545	29 40 24	2528	27 59 50	2511	26 18 52	2493
	Venus	E.	53 18 47	2591	51 39 39	2577	50 0 12	2564	48 20 27	2551
	Sun	E.	80 22 4	2894	78 49 38	2875	77 16 47	2856	75 43 32	2837
11	α Arietis	W.	94 26 6	2553	96 6 6	2535	97 46 30	2518	99 27 18	2502
	Aldebaran	W.	62 21 9	2402	64 4 41	2384	65 48 39	2366	67 33 3	2347
	Venus	E.	39 57 22	2492	38 15 58	2483	36 34 21	2475	34 52 32	2468
	Sun	E.	67 51 4	2741	66 15 19	2722	64 39 9	2704	63 2 34	2684
12	Aldebaran	W.	76 21 37	2259	78 8 37	2241	79 56 3	2225	81 43 54	2208
	Pollux	W.	33 15 7	2427	34 58 3	2396	36 41 44	2366	38 26 7	2339
	Venus	E.	26 22 5	2471	24 40 11	2485	22 58 36	2506	21 17 31	2539
	Sun	E.	54 53 20	2593	53 14 15	2575	51 34 46	2559	49 54 54	2542
13	Aldebaran	W.	90 49 16	2129	92 39 31	2115	94 30 7	2101	96 21 4	2088
	Pollux	W.	47 17 20	2222	49 5 14	2203	50 53 37	2185	52 42 27	2168
	Sun	E.	41 30 0	2467	39 48 0	2454	38 5 42	2441	36 23 6	2431
14	Aldebaran	W.	105 40 46	2028	107 33 36	2019	109 26 41	2010	111 20 0	2001
	Pollux	W.	61 52 48	2094	63 43 56	2082	65 35 23	2070	67 27 8	2060
	Sun	E.	27 46 47	2396	26 3 6	2394	24 19 23	2396	22 35 43	2402
18	**Sun**	W.	29 36 31	2447	31 18 59	2457	33 1 13	2467	34 43 12	2480
	α Aquilæ	E.	66 23 40	2750	64 48 6	2783	63 13 16	2821	61 39 15	2860
	Fomalhaut	E.	99 1 26	2355	97 16 47	2366	95 32 24	2380	93 48 20	2393
19	**Sun**	W.	43 8 25	2553	44 48 24	2570	46 28 0	2588	48 7 12	2605
	α Aquilæ	E.	54 3 11	3109	52 35 12	3171	51 8 28	3237	49 43 3	3310
	Fomalhaut	E.	85 13 16	2475	83 31 27	2493	81 50 5	2514	80 9 11	2534
20	**Sun**	W.	56 17 1	2699	57 53 42	2719	59 29 57	2738	61 5 46	2757
	α Aquilæ	E.	42 59 0	3776	41 43 33	3897	40 30 10	4029	39 18 59	4176
	Fomalhaut	E.	71 52 7	2649	70 14 18	2673	68 37 2	2699	67 0 21	2726
	α Pegasi	E.	87 12 27	2695	85 35 40	2716	83 59 21	2736	82 23 29	2758
21	**Sun**	W.	68 58 22	2857	70 31 36	2877	72 4 24	2897	73 36 47	2916
	Antares	W.	30 1 7	2730	31 37 7	2728	33 13 10	2729	34 49 12	2732
	Fomalhaut	E.	59 6 10	2873	57 33 17	2905	56 1 5	2939	54 29 36	2974
	α Pegasi	E.	74 31 32	2876	72 58 42	2901	71 26 24	2926	69 54 38	2953

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	$\mathrm{III}^{\mathrm{h}}$.	P. L. of Diff.	VI^{h}.	P. L. of Diff.	IX^{h}.	P. L. of Diff.
22	Sun	W.	75° 8′ 46″	2935	76° 40′ 20″	2953	78° 11′ 29″	2974	79° 42′ 14″	2993
	Antares	W.	36 25 9	2738	38 0 59	2744	39 36 41	2752	41 12 12	2760
	Fomalhaut	E.	52 58 51	3011	51 28 52	3049	49 59 40	3090	48 31 18	3132
	α Pegasi	E.	68 23 26	2980	66 52 48	3008	65 22 45	3037	63 53 18	3066
23	Sun	W.	87 10 17	3082	88 38 48	3101	90 6 57	3118	91 34 45	3134
	Antares	W.	49 6 39	2813	50 40 50	2825	52 14 46	2836	53 48 27	2848
	Fomalhaut	E.	41 23 5	3385	40 0 31	3447	38 39 8	3515	37 19 0	3587
	α Pegasi	E.	56 35 26	3229	55 9 51	3265	53 44 59	3303	52 20 51	3343
	α Arietis	E.	98 43 5	2868	97 10 5	2883	95 37 24	2898	94 5 2	2912
24	Sun	W.	98 48 56	3212	100 14 51	3226	101 40 29	3240	103 5 51	3253
	Antares	W.	61 33 6	2905	63 5 18	2916	64 37 16	2927	66 9 0	2938
	α Pegasi	E.	45 32 20	3576	44 13 20	3633	42 55 21	3693	41 38 26	3758
	α Arietis	E.	86 27 46	2963	84 57 12	2997	83 26 56	3010	81 56 56	3024
25	Sun	W.	110 8 49	3316	111 32 42	3327	112 56 22	3338	114 19 49	3350
	Antares	W.	73 44 24	2988	75 14 52	2997	76 45 9	3006	78 15 14	3014
	α Aquilæ	W.	36 20 38	4054	37 18 10	4822	38 17 28	4705	39 18 23	4602
	α Arietis	E.	74 31 4	3089	73 2 41	3102	71 34 34	3114	70 6 42	3128
26	Sun	W.	121 14 10	3396	122 36 31	3405	123 58 42	3413	125 20 44	3420
	Antares	W.	85 43 9	3053	87 12 16	3060	88 41 15	3066	90 10 6	3073
	α Aquilæ	W.	44 42 40	4223	45 50 44	4169	46 59 39	4119	48 9 22	4074
	α Arietis	E.	62 51 9	3189	61 24 47	3201	59 58 39	3214	58 32 47	3227
	Aldebaran	E.	94 2 1	2997	92 31 44	3004	91 1 36	3010	89 31 36	3016
27	Antares	W.	97 32 33	3100	99 0 43	3105	100 28 47	3109	101 56 46	3113
	α Aquilæ	W.	54 7 44	3903	55 21 1	3876	56 34 45	3852	57 48 54	3830
	α Arietis	E.	51 27 21	3296	50 3 5	3312	48 39 7	3328	47 15 28	3345
	Aldebaran	E.	82 3 23	3043	80 34 3	3047	79 4 48	3051	77 35 38	3054
28	α Aquilæ	W.	64 4 49	3742	65 20 52	3727	66 37 10	3714	67 53 42	3702
	α Arietis	E.	40 22 37	3451	39 1 18	3479	37 40 30	3508	36 20 15	3541
	Aldebaran	E.	70 10 45	3068	68 41 56	3069	67 13 9	3070	65 44 23	3071
29	α Aquilæ	W.	74 19 18	3653	75 36 55	3646	76 54 40	3638	78 12 33	3632
	Fomalhaut	W.	40 6 37	3741	41 22 41	3702	42 39 26	3667	43 56 48	3635
	α Pegasi	W.	29 14 55	4995	30 11 54	4827	31 11 8	4680	32 12 24	4551
	Aldebaran	E.	58 20 51	3074	56 52 10	3074	55 23 29	3074	53 54 48	3073
	Pollux	E.	102 22 0	3126	100 54 22	3125	99 26 43	3124	97 59 3	3124
30	Fomalhaut	W.	50 31 19	3511	51 51 31	3492	53 12 4	3473	54 32 58	3456
	α Pegasi	W.	37 43 26	4090	38 53 37	4025	40 4 52	3964	41 17 7	3911
	Aldebaran	E.	46 31 5	3067	45 2 15	3065	43 33 23	3064	42 4 29	3062
	Pollux	E.	90 40 21	3116	89 12 31	3114	87 44 39	3113	86 16 45	3110
31	Fomalhaut	W.	61 21 54	3385	62 44 28	3372	64 7 16	3361	65 30 17	3351
	α Pegasi	W.	47 30 33	3704	48 47 16	3671	50 4 34	3640	51 22 25	3612
	Aldebaran	E.	34 39 18	3049	33 10 6	3046	31 40 50	3043	30 11 31	3040
	Pollux	E.	78 56 35	3100	77 28 25	3096	76 0 11	3094	74 31 54	3091
	Saturn	E.	92 50 36	3060	91 21 38	3057	89 52 36	3054	88 23 30	3050

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
22	Sun	W.	81° 12′ 36″	3011	82° 42′ 35″	3030	84° 12′ 11″	3047	85° 41′ 25″	3065
	Antares	W.	42 47 32	2770	44 22 39	2780	45 57 33	2791	47 32 13	2801
	Fomalhaut	E.	47 3 47	3177	45 37 10	3224	44 11 29	3273	42 46 46	3326
	α Pegasi	E.	62 24 27	3096	60 56 13	3129	59 28 38	3161	58 1 42	3194
23	Sun	W.	93 2 13	3150	94 29 22	3166	95 56 12	3182	97 22 43	3197
	Antares	W.	55 21 52	2859	56 55 3	2871	58 27 59	2883	60 0 40	2894
	Fomalhaut	E.	36 0 12	3668	34 42 51	3758	33 27 5	3857	32 13 2	3967
	α Pegasi	E.	50 57 29	3384	49 34 54	3428	48 13 9	3475	46 52 17	3525
	α Arietis	E.	92 32 58	2927	91 1 13	2941	89 29 46	2955	87 58 37	2969
24	Sun	W.	104 30 57	3266	105 55 48	3280	107 20 23	3293	108 44 43	3305
	Antares	W.	67 40 31	2949	69 11 48	2958	70 42 53	2969	72 13 45	2979
	α Pegasi	E.	40 22 40	3828	39 8 7	3905	37 54 52	3988	36 43 1	4082
	α Arietis	E.	80 27 13	3037	78 57 46	3051	77 28 36	3064	75 59 42	3077
25	Sun	W.	115 43 3	3359	117 6 6	3369	118 28 58	3379	119 51 39	3387
	Antares	W.	79 45 9	3023	81 14 53	3030	82 44 28	3039	84 13 53	3046
	α Aquilæ	W.	40 20 46	4509	41 24 30	4426	42 29 28	4352	43 35 33	4284
	α Arietis	E.	68 39 6	3140	67 11 45	3152	65 44 38	3164	64 17 46	3177
26	Sun	W.	126 42 38	3428	128 4 23	3435	129 26 0	3441	130 47 30	3448
	Antares	W.	91 38 49	3078	93 7 25	3084	94 35 54	3089	96 4 17	3095
	α Aquilæ	W.	49 19 49	4033	50 30 56	3997	51 42 39	3962	52 54 56	3931
	α Arietis	E.	57 7 10	3241	55 41 49	3253	54 16 43	3268	52 51 54	3282
	Aldebaran	E.	88 1 43	3022	86 31 57	3028	85 2 19	3034	83 32 48	3039
27	Antares	W.	103 24 40	3117	104 52 29	3120	106 20 14	3124	107 47 55	3127
	α Aquilæ	W.	59 3 25	3809	60 18 18	3791	61 33 30	3772	62 49 1	3756
	α Arietis	E.	45 52 9	3364	44 29 11	3383	43 6 35	3404	41 44 23	3427
	Aldebaran	E.	76 6 32	3057	74 37 30	3060	73 8 32	3063	71 39 37	3065
28	α Aquilæ	W.	69 10 27	3691	70 27 24	3680	71 44 32	3671	73 1 50	3662
	α Arietis	E.	35 0 36	3578	33 41 38	3620	32 23 25	3666	31 6 2	3721
	Aldebaran	E.	64 15 38	3073	62 46 55	3073	61 18 13	3074	59 49 32	3074
29	α Aquilæ	W.	79 30 33	3626	80 48 39	3621	82 6 51	3615	83 25 9	3610
	Fomalhaut	W.	45 14 44	3607	46 33 11	3580	47 52 7	3555	49 11 30	3532
	α Pegasi	W.	33 15 31	4437	34 20 19	4334	35 26 40	4244	36 34 25	4163
	Aldebaran	E.	52 26 6	3073	50 57 23	3072	49 28 39	3070	47 59 53	3069
	Pollux	E.	96 31 22	3122	95 3 39	3121	93 35 55	3119	92 8 9	3118
30	Fomalhaut	W.	55 54 11	3440	57 15 42	3425	58 37 30	3411	59 59 34	3397
	α Pegasi	W.	42 30 16	3861	43 44 15	3817	44 59 0	3776	46 14 27	3739
	Aldebaran	E.	40 35 33	3060	39 6 34	3057	37 37 32	3055	36 8 27	3052
	Pollux	E.	84 48 48	3109	83 20 49	3106	81 52 47	3104	80 24 42	3102
31	Fomalhaut	W.	66 53 30	3340	68 16 55	3330	69 40 32	3320	71 4 20	3311
	α Pegasi	W.	52 40 46	3587	53 59 34	3564	55 18 48	3541	56 38 27	3519
	Aldebaran	E.	28 42 8	3037	27 12 41	3034	25 43 10	3030	24 13 34	3026
	Pollux	E.	73 3 34	3089	71 35 11	3087	70 6 45	3083	68 38 15	3081
	Saturn	E.	86 54 19	3046	85 25 3	3043	83 55 43	3039	82 26 19	3035

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Tues.	1	14 25 28.46	9.792	S. 14 25 34.4	−48.11	16 9.83	66.94	16 18.38	0.063
Wed.	2	14 29 23.88	9.827	14 44 42.3	47.53	16 10.08	67.06	16 19.51	0.029
Thur.	3	14 33 20.12	9.861	15 3 35.9	46.92	16 10.32	67.17	16 19.83	0.005
Frid.	4	14 37 17.18	9.896	15 22 14.8	−46.30	16 10.56	67.29	16 19.32	0.040
Sat.	5	14 41 15.08	9.931	15 40 38.6	45.66	16 10.80	67.40	16 17.98	0.075
SUN.	6	14 45 13.83	9.966	15 58 46.9	45.01	16 11.03	67.52	16 15.79	0.110
Mon.	7	14 49 13.44	10.002	16 16 39.2	−44.34	16 11.26	67.64	16 12.75	0.146
Tues.	8	14 53 13.90	10.037	16 34 15.2	43.66	16 11.49	67.76	16 8.85	0.181
Wed.	9	14 57 15.23	10.073	16 51 34.5	42.95	16 11.72	67.88	16 4.08	0.217
Thur.	10	15 1 17.43	10.109	17 8 36.8	−42.23	16 11.94	68.00	15 58.45	0.253
Frid.	11	15 5 20.50	10.145	17 25 21.5	41.49	16 12.16	68.12	15 51.96	0.289
Sat.	12	15 9 24.43	10.182	17 41 48.3	40.73	16 12.38	68.24	15 44.60	0.325
SUN.	13	15 13 29.23	10.218	17 57 56.8	−39.96	16 12.60	68.36	15 36.37	0.360
Mon.	14	15 17 34.89	10.254	18 13 46.5	39.16	16 12.81	68.48	15 27.29	0.396
Tues.	15	15 21 41.41	10.288	18 29 17.1	38.36	16 13.02	68.60	15 17.36	0.431
Wed.	16	15 25 48.77	10.324	18 44 28.2	−37.54	16 13.23	68.71	15 6.58	0.467
Thur.	17	15 29 56.98	10.359	18 59 19.2	36.70	16 13.44	68.83	14 54.96	0.502
Frid.	18	15 34 6.02	10.393	19 13 49.8	35.84	16 13.64	68.94	14 42.52	0.536
Sat.	19	15 38 15.87	10.427	19 27 59.7	−34.97	16 13.85	69.06	14 29.26	0.570
SUN.	20	15 42 26.53	10.461	19 41 48.5	34.08	16 14.05	69.17	14 15.19	0.604
Mon.	21	15 46 37.98	10.494	19 55 15.7	33.17	16 14.25	69.28	14 0.33	0.637
Tues.	22	15 50 50.22	10.526	20 8 21.0	−32.25	16 14.45	69.39	13 44.69	0.669
Wed.	23	15 55 3.24	10.558	20 21 4.1	31.32	16 14.64	69.50	13 28.27	0.701
Thur.	24	15 59 17.02	10.589	20 33 24.5	30.37	16 14.83	69.61	13 11.09	0.732
Frid.	25	16 3 31.56	10.621	20 45 21.9	−29.41	16 15.01	69.72	12 53.16	0.763
Sat.	26	16 7 46.83	10.651	20 56 56.1	28.43	16 15.19	69.83	12 34.49	0.793
SUN.	27	16 12 2.82	10.681	21 8 6.7	27.44	16 15.36	69.93	12 15.11	0.823
Mon.	28	16 16 19.52	10.710	21 18 53.3	−26.44	16 15.53	70.02	11 55.02	0.852
Tues.	29	16 20 36.93	10.739	21 29 15.6	25.42	16 15.69	70.12	11 34.23	0.881
Wed.	30	16 24 55.02	10.767	21 39 13.4	24.39	16 15.85	70.21	11 12.75	0.909
Thur.	31	16 29 13.77	10.794	S. 21 48 46.5	−23.35	16 16.00	70.30	10 50.62	0.936

Note.—The mean time of semidiameter passing may be found by subtracting $0^s.18$ from the sidereal time.
The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Tues.	1	14 25 31.12	9.793	S. 14 25 47.5	−48.11	16 18.39	0.063	14 41 49.50
Wed.	2	14 29 26.55	9.827	14 44 55.3	47.52	16 19.51	0.029	14 45 46.06
Thur.	3	14 33 22.80	9.861	15 3 48.7	46.91	16 19.82	0.005	14 49 42.62
Frid.	4	14 37 19.87	9.896	15 22 27.4	−46.29	16 19.30	0.040	14 53 39.17
Sat.	5	14 41 17.77	9.931	15 40 51.0	45.65	16 17.95	0.075	14 57 35.73
SUN.	6	14 45 16.53	9.966	15 58 59.1	45.00	16 15.75	0.110	15 1 32.28
Mon.	7	14 49 16.14	10.002	16 16 51.2	−44.33	16 12.70	0.146	15 5 28.84
Tues.	8	14 53 16.60	10.037	16 34 27.0	43.65	16 8.79	0.181	15 9 25.39
Wed.	9	14 57 17.93	10.073	16 51 46.1	42.94	16 4.02	0.217	15 13 21.95
Thur.	10	15 1 20.12	10.109	17 8 48.1	−42.22	15 58.38	0.253	15 17 18.50
Frid.	11	15 5 23.18	10.145	17 25 32.5	41.48	15 51.88	0.289	15 21 15.06
Sat.	12	15 9 27.10	10.181	17 41 59.0	40.72	15 44.51	0.325	15 25 11.61
SUN.	13	15 13 31.89	10.216	17 58 7.2	−39.95	15 36.28	0.360	15 29 8.17
Mon.	14	15 17 37.54	10.252	18 13 56.6	39.16	15 27.19	0.396	15 33 4.72
Tues.	15	15 21 44.03	10.287	18 29 26.9	38.35	15 17.25	0.431	15 37 1.28
Wed.	16	15 25 51.37	10.323	18 44 37.6	−37.53	15 6.46	0.467	15 40 57.83
Thur.	17	15 29 59.55	10.358	18 59 28.3	36.69	14 54.84	0.502	15 44 54.39
Frid.	18	15 34 8.56	10.392	19 13 58.6	35.83	14 42.39	0.536	15 48 50.94
Sat.	19	15 38 18.38	10.426	19 28 8.2	−34.96	14 29.12	0.570	15 52 47.50
SUN.	20	15 42 29.01	10.460	19 41 56.6	34.07	14 15.04	0.604	15 56 44.05
Mon.	21	15 46 40.43	10.493	19 55 23.5	33.16	14 0.18	0.637	16 0 40.61
Tues.	22	15 50 52.63	10.525	20 8 28.4	−32.24	13 44.53	0.669	16 4 37.16
Wed.	23	15 55 5.61	10.557	20 21 11.1	31.31	13 28.11	0.701	16 8 33.72
Thur.	24	15 59 19.35	10.588	20 33 31.2	30.36	13 10.93	0.732	16 12 30.28
Frid.	25	16 3 33.84	10.619	20 45 28.3	−29.40	12 53.00	0.763	16 16 26.84
Sat.	26	16 7 49.06	10.649	20 57 2.1	28.42	12 34.33	0.793	16 20 23.39
SUN.	27	16 12 5.00	10.679	21 8 12.3	27.43	12 14.94	0.823	16 24 19.95
Mon.	28	16 16 21.65	10.708	21 18 58.5	−26.43	11 54.85	0.852	16 28 16.50
Tues.	29	16 20 39.00	10.737	21 29 20.5	25.41	11 34.06	0.881	16 32 13.06
Wed.	30	16 24 57.03	10.765	21 39 18.0	24.38	11 12.58	0.909	16 36 9.61
Thur.	31	16 29 15.72	10.792	S. 21 48 50.7	−23.34	10 50.45	0.936	16 40 6.17

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour,
$+\ 9^{s}.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	305	218 46 19.4	45 51.2	150.17	− 0.16	9.9964774	− 46.4	9 16 39.06
2	306	219 46 24.5	45 56.2	150.25	0.13	9.9963669	45.7	9 12 43.16
3	307	220 46 31.6	46 3.2	150.33	− 0.07	9.9962580	45.0	9 8 47.24
4	308	221 46 40.7	46 12.2	150.42	+ 0.01	9.9961507	− 44.4	9 4 51.34
5	309	222 46 51.9	46 23.3	150.50	0.11	9.9960449	43.8	9 0 55.43
6	310	223 47 5.1	46 36.4	150.59	0.23	9.9959405	43.2	8 56 59.52
7	311	224 47 20.4	46 51.5	150.67	+ 0.36	9.9958375	− 42.6	8 53 3.60
8	312	225 47 37.7	47 8.7	150.76	0.51	9.9957358	42.1	8 49 7.69
9	313	226 47 57.0	47 27.9	150.84	0.64	9.9956354	41.6	8 45 11.78
10	314	227 48 18.2	47 49.0	150.92	+ 0.76	9 9955361	− 41.2	8 41 15.87
11	315	228 48 41.4	48 12.0	151.00	0.86	9.9954378	40.8	8 37 19.96
12	316	229 49 6.5	48 37.0	151.08	0.94	9.9953405	40.4	8 33 24 05
13	317	230 49 33.4	49 3.8	151.16	+ 0.99	9.9952440	− 40.1	8 29 28.14
14	318	231 50 2.1	49 32.4	151.23	1.01	9.9951484	39.7	8 25 32.23
15	319	232 50 32.5	50 2.6	151.30	1.01	9.9950536	39.4	8 21 36.32
16	320	233 51 4.5	50 34.4	151.36	+ 0.96	9.9949596	− 39.0	8 17 40.41
17	321	234 51 38.0	51 7.8	151.42	0.90	9.9948666	38.6	8 13 44.50
18	322	235 52 13.0	51 42.7	151.48	0.81	9.9947746	38.1	8 9 48.59
19	323	236 52 49.3	52 18.9	151.54	+ 0.70	9.9946837	− 37.6	8 5 52.69
20	324	237 53 26.8	52 56.2	151.59	0.58	9.9945940	37.1	8 1 56.78
21	325	238 54 5.5	53 34.7	151.64	0.44	9.9945055	36.5	7 58 0.87
22	326	239 54 45.3	54 14.4	151.68	+ 0.31	9.9944184	− 35.9	7 54 4.96
23	327	240 55 26 3	54 55.3	151.73	0.19	9.9943329	35.2	7 50 9.04
24	328	241 56 8.4	55 37.2	151.77	+ 0.07	9.9942492	34.5	7 46 13.13
25	329	242 56 51.6	56 20.2	151.82	− 0.02	9.9941675	− 33.6	7 42 17.22
26	330	243 57 35.8	57 4.2	151.86	0.09	9.9940879	32.7	7 38 21.31
27	331	244 58 21.0	57 49.3	151.91	0.13	9.9940104	31.8	7 34 25.40
28	332	245 59 7.3	58 35.5	151.96	− 0.14	9.9939353	− 30.8	7 30 29.49
29	333	246 59 54.7	59 22.7	152.01	0.12	9.9938626	29.8	7 26 33.58
30	334	248 0 43.2	0 11.0	152.05	− 0.07	9.9937923	28.8	7 22 37.67
31	335	249 1 32.9	1 0.6	152.10	+ 0.01	9.9937244	− 27.8	7 18 41.76

Note.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January $0^d.0$.

Diff. for 1 Hour,
— $9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 48.8	14 50.8	54 15.1	+0.54	54 22.2	+0.64	12 38.7	1.88	15.6
2	14 53.0	14 55.6	54 30.4	0.73	54 39.8	0.83	13 24.7	1.96	16.6
3	14 58.4	15 1.7	54 50.4	0.93	55 2.2	1.04	14 12.8	2.04	17.6
4	15 5.2	15 9.1	55 15.3	+1.15	55 29.7	+1.26	15 2.7	2.12	18.6
5	15 13.4	15 18.0	55 45.4	1.36	56 2.4	1.48	15 54.2	2.17	19.6
6	15 23.1	15 28.4	56 20.8	1.59	56 40.5	1.69	16 46.7	2.20	20.6
7	15 34.1	15 40 1	57 1.4	+1.79	57 23.4	+1.87	17 39.6	2.21	21.6
8	15 46.3	15 52.8	57 46.3	1.94	58 9.9	1.98	18 32.5	2.20	22.6
9	15 59.3	16 5.8	58 33.8	1.99	58 57.7	1.97	19 25.3	2.20	23.6
10	16 12.1	16 18.2	59 21.1	+1.91	59 43.4	+1.79	20 18.1	2.21	24.6
11	16 23.9	16 28.9	60 4.1	1.63	60 22.6	1.43	21 11.3	2.24	25.6
12	16 33.2	16 36.5	60 38.3	1.17	60 50.6	0.86	22 5.6	2.29	26.6
13	16 38.8	16 39.9	60 59.0	+0.52	61 3.0	+0.15	23 1.4	2.36	27.6
14	16 39.8	16 38.4	61 2.5	−0.23	60 57.4	−0.62	23 58.8	2.43	28.6
15	16 35.7	16 31.9	60 47.7	0.99	60 33.7	1.33	δ		0.2
16	16 27.0	16 21.2	60 15.7	−1.64	59 54.4	−1.89	0 57.6	2.46	1.2
17	16 14.6	16 7.5	59 30.3	2.10	59 4.1	2.25	1 56.7	2.45	2.2
18	16 0.0	15 52.2	58 36.4	2.34	58 8 0	2.37	2 54.8	2.38	3.2
19	15 44.5	15 36.9	57 39.5	−2.36	57 11.5	−2.30	3 50.7	2.27	4.2
20	15 29.5	15 22.5	56 44.4	2.20	56 18.7	2.07	4 43.6	2.13	5.2
21	15 16.0	15 10.0	55 54.8	1.91	55 33.0	1.73	5 33.0	1.99	6.2
22	15 4.7	15 0.0	55 13.4	−1.54	54 56.1	−1.34	6 19.5	1.88	7.2
23	14 56.0	14 52.6	54 41.3	1.13	54 29.1	0.92	7 3.6	1.80	8.2
24	14 50.0	14 48.0	54 19.3	0.72	54 11.9	0.52	7 46.1	1.75	9.2
25	14 46.6	14 45.9	54 6.9	−0.32	54 4.2	−0.13	8 27.8	1.73	10.2
26	14 45.7	14 46.1	54 3.7	+0.04	54 5.1	+0.20	9 9.4	1.75	11.2
27	14 47.0	14 48.3	54 8.3	0.34	54 13.2	0.48	9 51.8	1.79	12.2
28	14 50.1	14 52.2	54 19.7	+0.60	54 27.5	+0.70	10 35.6	1.86	13.2
29	14 54.7	14 57.4	54 36.5	0.80	54 46.6	0.88	11 21.3	1.95	14.2
30	15 0.4	15 3.6	54 57.5	0.94	55 9.2	1.00	12 9.1	2.04	15.2
31	15 6.9	15 10.5	55 21.6	+1.06	55 34.6	+1.10	12 59.1	2.13	16.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 57 39.58	1.9522	N.11 40 55.8	8.562
1	2 59 36.79	1.9548	11 49 28.1	8.515
2	3 1 34.16	1.9574	11 57 57.6	8.467
3	3 3 31.68	1.9600	12 6 24.2	8.419
4	3 5 29.36	1.9627	12 14 47.9	8.370
5	3 7 27.21	1.9656	12 23 8.6	8.320
6	3 9 25.23	1.9683	12 31 26.3	8.270
7	3 11 23.41	1.9710	12 39 41.0	8.219
8	3 13 21.75	1.9738	12 47 52.6	8.168
9	3 15 20.26	1.9766	12 56 1.1	8.116
10	3 17 18.94	1.9794	13 4 6.5	8.063
11	3 19 17.79	1.9823	13 12 8.7	8.010
12	3 21 16.81	1.9852	13 20 7.7	7.956
13	3 23 16.01	1.9881	13 28 3.4	7.900
14	3 25 15.38	1.9909	13 35 55.7	7.844
15	3 27 14.92	1.9938	13 43 44.7	7.788
16	3 29 14.64	1.9967	13 51 30.3	7.731
17	3 31 14.53	1.9997	13 59 12.4	7.673
18	3 33 14.60	2.0027	14 6 51.0	7.614
19	3 35 14.85	2.0057	14 14 26.1	7.555
20	3 37 15.28	2.0087	14 21 57.6	7.496
21	3 39 15.89	2.0117	14 29 25.6	7.436
22	3 41 16.68	2.0147	14 36 49.9	7.374
23	3 43 17.65	2.0177	N.14 44 10.5	7.312

WEDNESDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	3 45 18.81	2.0208	N.14 51 27.4	7.250
1	3 47 20.15	2.0238	14 58 40.5	7.187
2	3 49 21.67	2.0269	15 5 49.8	7.122
3	3 51 23.38	2.0300	15 12 55.2	7.057
4	3 53 25.27	2.0331	15 19 56.7	6.992
5	3 55 27.35	2.0362	15 26 54.3	6.927
6	3 57 29.62	2.0393	15 33 47.9	6.860
7	3 59 32.07	2.0424	15 40 37.5	6.792
8	4 1 34.71	2.0456	15 47 23.0	6.724
9	4 3 37.54	2.0487	15 54 4.4	6.656
10	4 5 40.56	2.0519	16 0 41.7	6.587
11	4 7 43.77	2.0550	16 7 14.8	6.516
12	4 9 47.16	2.0582	16 13 43.6	6.445
13	4 11 50.75	2.0613	16 20 8.2	6.374
14	4 13 54.52	2.0644	16 26 28.5	6.301
15	4 15 58.48	2.0676	16 32 44.4	6.228
16	4 18 2.63	2.0707	16 38 55.9	6.155
17	4 20 6.97	2.0739	16 45 3.0	6.082
18	4 22 11.50	2.0771	16 51 5.7	6.007
19	4 24 16.22	2.0802	16 57 3.8	5.931
20	4 26 21.13	2.0834	17 2 57.4	5.855
21	4 28 26.23	2.0866	17 8 46.4	5.778
22	4 30 31.52	2.0898	17 14 30.8	5.701
23	4 32 37.00	2.0930	17 20 10.5	5.622
24	4 34 42.68	2.0962	N.17 25 45.5	5.543

THURSDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 34 42.68	2.0962	N.17 25 45.5	5.543
1	4 36 48.55	2.0993	17 31 15.7	5.464
2	4 38 54.60	2.1023	17 36 41.2	5.385
3	4 41 0.83	2.1054	17 42 1.9	5.304
4	4 43 7.25	2.1086	17 47 17.7	5.223
5	4 45 13.86	2.1117	17 52 28.6	5.141
6	4 47 20.66	2.1148	17 57 34.6	5.058
7	4 49 27.64	2.1179	18 2 35.6	4.975
8	4 51 34.81	2.1211	18 7 31.6	4.892
9	4 53 42.17	2.1242	18 12 22.6	4.807
10	4 55 49.71	2.1272	18 17 8.5	4.722
11	4 57 57.44	2.1303	18 21 49.3	4.637
12	5 0 5.35	2.1333	18 26 24.9	4.550
13	5 2 13.44	2.1363	18 30 55.3	4.463
14	5 4 21.71	2.1394	18 35 20.5	4.376
15	5 6 30.17	2.1424	18 39 40.4	4.288
16	5 8 38.80	2.1453	18 43 55.0	4.199
17	5 10 47.61	2.1483	18 48 4.3	4.111
18	5 12 56.60	2.1513	18 52 8.3	4.021
19	5 15 5.77	2.1542	18 56 6.8	3.930
20	5 17 15.11	2.1572	18 59 59.9	3.839
21	5 19 24.63	2.1601	19 3 47.5	3.748
22	5 21 34.32	2.1630	19 7 29.6	3.656
23	5 23 44.19	2.1659	N.19 11 6.2	3.563

FRIDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	5 25 54.23	2.1688	N.19 14 37.2	3.470
1	5 28 4.44	2.1716	19 18 2.6	3.377
2	5 30 14.82	2.1743	19 21 22.4	3.283
3	5 32 25.36	2.1771	19 24 36.5	3.188
4	5 34 36.07	2.1798	19 27 44.9	3.093
5	5 36 46.94	2.1826	19 30 47.6	2.998
6	5 38 57.98	2.1853	19 33 44.6	2.901
7	5 41 9.18	2.1880	19 36 35.8	2.804
8	5 43 20.54	2.1906	19 39 21.1	2.707
9	5 45 32.05	2.1932	19 42 0.6	2.609
10	5 47 43.72	2.1958	19 44 34.2	2.511
11	5 49 55.55	2.1985	19 47 1.9	2.412
12	5 52 7.54	2.2011	19 49 23.7	2.313
13	5 54 19.68	2.2036	19 51 39.5	2.213
14	5 56 31.97	2.2060	19 53 49.3	2.113
15	5 58 44.40	2.2084	19 55 53.1	2.013
16	6 0 56.98	2.2108	19 57 50.9	1.913
17	6 3 9.70	2.2133	19 59 42.7	1.812
18	6 5 22.57	2.2157	20 1 28.4	1.710
19	6 7 35.58	2.2180	20 3 7.9	1.608
20	6 9 48.73	2.2202	20 4 41.3	1.506
21	6 12 2.01	2.2225	20 6 8.6	1.403
22	6 14 15.43	2.2247	20 7 29.7	1.300
23	6 16 28.98	2.2269	20 8 44.6	1.196
24	6 18 42.66	2.2291	N.20 9 53.2	1.092

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 18 42.66	2.2291	N.20 9 53.2	1.092
1	6 20 56.47	2.2312	20 10 55.6	0.988
2	6 23 10.41	2.2333	20 11 51.7	0.883
3	6 25 24.47	2.2354	20 12 41.5	0.778
4	6 27 38.66	2.2375	20 13 25.0	0.673
5	6 29 52.97	2.2394	20 14 2.2	0.567
6	6 32 7.39	2.2413	20 14 33.0	0.460
7	6 34 21.93	2.2433	20 14 57.4	0.354
8	6 36 36.59	2.2452	20 15 15.5	0.248
9	6 38 51.36	2.2471	20 15 27.2	0.141
10	6 41 6.24	2.2488	20 15 32.5	+0.034
11	6 43 21.22	2.2506	20 15 31.3	−0.073
12	6 45 36.31	2.2523	20 15 23.7	0.181
13	6 47 51.50	2.2540	20 15 9.6	0.289
14	6 50 6.79	2.2557	20 14 49.0	0.396
15	6 52 22.18	2.2573	20 14 22.0	0.504
16	6 54 37.67	2.2590	20 13 48.5	0.613
17	6 56 53.26	2.2606	20 13 8.4	0.723
18	6 59 8.94	2.2620	20 12 21.7	0.832
19	7 1 24.70	2.2634	20 11 28.5	0.941
20	7 3 40.55	2.2649	20 10 28.8	1.049
21	7 5 56.49	2.2663	20 9 22.6	1.158
22	7 8 12.51	2.2676	20 8 9.8	1.268
23	7 10 28.61	2.2689	N.20 6 50.4	1.378

SUNDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 12 44.78	2.2702	N.20 5 24.4	1.488
1	7 15 1.03	2.2714	20 3 51.8	1.598
2	7 17 17.35	2.2727	20 2 12.6	1.707
3	7 19 33.75	2.2738	20 0 26.9	1.817
4	7 21 50.21	2.2749	19 58 34.5	1.928
5	7 24 6.74	2.2761	19 56 35.5	2.039
6	7 26 23.34	2.2772	19 54 29.8	2.150
7	7 28 40.00	2.2781	19 52 17.5	2.260
8	7 30 56.71	2.2790	19 49 58.6	2.370
9	7 33 13.48	2.2800	19 47 33.1	2.481
10	7 35 30.31	2.2809	19 45 0.9	2.592
11	7 37 47.19	2.2817	19 42 22.1	2.702
12	7 40 4.12	2.2826	19 39 36.7	2.812
13	7 42 21.10	2.2834	19 36 44.7	2.922
14	7 44 38.13	2.2842	19 33 46.0	3.033
15	7 46 55.20	2.2849	19 30 40.7	3.143
16	7 49 12.32	2.2856	19 27 28.8	3.254
17	7 51 29.47	2.2862	19 24 10.2	3.365
18	7 53 46.66	2.2868	19 20 45.0	3.475
19	7 56 3.89	2.2874	19 17 13.2	3.585
20	7 58 21.15	2.2879	19 13 34.8	3.695
21	8 0 38.44	2.2885	19 9 49.8	3.805
22	8 2 55.77	2.2890	19 5 58.2	3.915
23	8 5 13.12	2.2894	19 2 0.0	4.024
24	8 7 30.50	2.2898	N.18 57 55.3	4.133

MONDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 7 30.50	2.2898	N.18 57 55.3	4.133
1	8 9 47.90	2.2903	18 53 44.0	4.243
2	8 12 5.33	2.2907	18 49 26.1	4.353
3	8 14 22.78	2.2910	18 45 1.6	4.462
4	8 16 40.25	2.2912	18 40 30.6	4.571
5	8 18 57.73	2.2915	18 35 53.1	4.679
6	8 21 15.23	2.2917	18 31 9.1	4.788
7	8 23 32.74	2.2920	18 26 18.5	4.896
8	8 25 50.27	2.2922	18 21 21.5	5.004
9	8 28 7.81	2.2924	18 16 18.0	5.112
10	8 30 25.36	2.2925	18 11 8.0	5.220
11	8 32 42.91	2.2926	18 5 51.6	5.327
12	8 35 0.47	2.2927	18 0 28.8	5.434
13	8 37 18.03	2.2927	17 54 59.5	5.541
14	8 39 35.60	2.2928	17 49 23.9	5.647
15	8 41 53.17	2.2928	17 43 41.9	5.753
16	8 44 10.74	2.2928	17 37 53.5	5.859
17	8 46 28.31	2.2929	17 31 58.8	5.964
18	8 48 45.89	2.2929	17 25 57.8	6.069
19	8 51 3.46	2.2928	17 19 50.5	6.174
20	8 53 21.03	2.2927	17 13 36.9	6.278
21	8 55 38.59	2.2926	17 7 17.1	6.382
22	8 57 56.14	2.2925	17 0 51.1	6.486
23	9 0 13.69	2.2924	N.16 54 18.8	6.590

TUESDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 2 31.23	2.2922	N.16 47 40.3	6.692
1	9 4 48.76	2.2921	16 40 55.7	6.794
2	9 7 6.28	2.2919	16 34 5.0	6.896
3	9 9 23.79	2.2917	16 27 8.2	6.998
4	9 11 41.29	2.2916	16 20 5.3	7.099
5	9 13 58.78	2.2914	16 12 56.3	7.200
6	9 16 16.26	2.2912	16 5 41.3	7.300
7	9 18 33.72	2.2909	15 58 20.3	7.399
8	9 20 51.17	2.2907	15 50 53.4	7.498
9	9 23 8.61	2.2905	15 43 20.6	7.596
10	9 25 26.03	2.2903	15 35 41.9	7.694
11	9 27 43.44	2.2901	15 27 57.3	7.791
12	9 30 0.84	2.2898	15 20 6.9	7.888
13	9 32 18.22	2.2895	15 12 10.7	7.985
14	9 34 35.58	2.2892	15 4 8.7	8.081
15	9 36 52.93	2.2890	14 56 1.0	8.176
16	9 39 10.26	2.2887	14 47 47.6	8.270
17	9 41 27.57	2.2884	14 39 28.6	8.364
18	9 43 44.87	2.2882	14 31 3.9	8.458
19	9 46 2.15	2.2879	14 22 33.6	8.551
20	9 48 19.42	2.2877	14 13 57.8	8.643
21	9 50 36.67	2.2874	14 5 16.5	8.734
22	9 52 53.91	2.2871	13 56 29.7	8.825
23	9 55 11.13	2.2868	13 47 37.5	8.914
24	9 57 28.33	2.2866	N.13 38 40.0	9.003

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 57 28.33	2.2866	N.13 38 40.0	9.003
1	9 59 45.52	2.2863	13 29 37.1	9.092
2	10 2 2.69	2.2861	13 20 28.9	9.181
3	10 4 19.85	2.2859	13 11 15.4	9.268
4	10 6 37.00	2.2857	13 1 56.7	9.354
5	10 8 54.13	2.2854	12 52 32.9	9.439
6	10 11 11.25	2.2852	12 43 4.0	9.524
7	10 13 28.36	2.2851	12 33 30.0	9.608
8	10 15 45.46	2.2848	12 23 51.0	9.692
9	10 18 2.54	2.2846	12 14 7.0	9.775
10	10 20 19.61	2.2845	12 4 18.0	9.857
11	10 22 36.68	2.2844	11 54 24.1	9.938
12	10 24 53.74	2.2842	11 44 25.4	10.018
13	10 27 10.79	2.2841	11 34 21.9	10.097
14	10 29 27.83	2.2840	11 24 13.7	10.176
15	10 31 44.87	2.2840	11 14 0.8	10.253
16	10 34 1.91	2.2839	11 3 43.3	10.330
17	10 36 18.94	2.2838	10 53 21.2	10.407
18	10 38 35.97	2.2838	10 42 54.5	10.482
19	10 40 53.00	2.2838	10 32 23.4	10.555
20	10 43 10.03	2.2838	10 21 47.9	10.628
21	10 45 27.06	2.2838	10 11 8.0	10.701
22	10 47 44.09	2.2839	10 0 23.8	10.772
23	10 50 1.13	2.2840	N. 9 49 35.3	10.842

THURSDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 52 18.17	2.2841	N. 9 38 42.7	10.911
1	10 54 35.22	2.2842	9 27 46.0	10.980
2	10 56 52.28	2.2843	9 16 45.1	11.048
3	10 59 9.34	2.2844	9 5 40.2	11.114
4	11 1 26.41	2.2847	8 54 31.4	11.179
5	11 3 43.50	2.2850	8 43 18.7	11.244
6	11 6 0.61	2.2852	8 32 2.1	11.308
7	11 8 17.73	2.2855	8 20 41.7	11.370
8	11 10 34.87	2.2857	8 9 17.7	11.430
9	11 12 52.02	2.2860	7 57 50.1	11.490
10	11 15 9.19	2.2864	7 46 18.9	11.550
11	11 17 26.39	2.2869	7 34 44.1	11.608
12	11 19 43.62	2.2873	7 23 5.9	11.665
13	11 22 0.87	2.2877	7 11 24.3	11.721
14	11 24 18.15	2.2882	6 59 39.4	11.776
15	11 26 35.45	2.2886	6 47 51.2	11.829
16	11 28 52.78	2.2892	6 35 59.9	11.881
17	11 31 10.15	2.2898	6 24 5.5	11.932
18	11 33 27.56	2.2904	6 12 8.0	11.982
19	11 35 45.00	2.2910	6 0 7.6	12.031
20	11 38 2.48	2.2917	5 48 4.3	12.079
21	11 40 20.00	2.2924	5 35 58.1	12.126
22	11 42 37.57	2.2932	5 23 49.2	12.171
23	11 44 55.18	2.2939	5 11 37.6	12.215
24	11 47 12.84	2.2947	N. 4 59 23.4	12.257

FRIDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 47 12.84	2.2947	N. 4 59 23.4	12.257
1	11 49 30.55	2.2956	4 47 6.7	12.299
2	11 51 48.31	2.2964	4 34 47.5	12.340
3	11 54 6.12	2.2973	4 22 25.9	12.379
4	11 56 23.99	2.2983	4 10 2.0	12.417
5	11 58 41.92	2.2992	3 57 35.9	12.453
6	12 0 59.90	2.3002	3 45 7.7	12.488
7	12 3 17.95	2.3013	3 32 37.4	12.522
8	12 5 36.06	2.3024	3 20 5.1	12.554
9	12 7 54.24	2.3036	3 7 30.9	12.585
10	12 10 12.49	2.3047	2 54 54.9	12.615
11	12 12 30.81	2.3058	2 42 17.1	12.644
12	12 14 49.19	2.3070	2 29 37.6	12.671
13	12 17 7.65	2.3083	2 16 56.6	12.696
14	12 19 26.19	2.3097	2 4 14.1	12.721
15	12 21 44.81	2.3110	1 51 30.1	12.744
16	12 24 3.51	2.3124	1 38 44.8	12.765
17	12 26 22.30	2.3138	1 25 58.3	12.785
18	12 28 41.17	2.3152	1 13 10.6	12.804
19	12 31 0.13	2.3167	1 0 21.8	12.822
20	12 33 19.18	2.3182	0 47 32.0	12.838
21	12 35 38.32	2.3197	0 34 41.3	12.852
22	12 37 57.55	2.3213	0 21 49.8	12.864
23	12 40 16.88	2.3230	N. 0 8 57.6	12.875

SATURDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 42 36.31	2.3247	S. 0 3 55.2	12.885
1	12 44 55.84	2.3263	0 16 48.6	12.894
2	12 47 15.47	2.3280	0 29 42.5	12.901
3	12 49 35.20	2.3298	0 42 36.7	12.906
4	12 51 55.04	2.3316	0 55 31.2	12.910
5	12 54 14.99	2.3335	1 8 25.9	12.912
6	12 56 35.06	2.3354	1 21 20.7	12.913
7	12 58 55.24	2.3373	1 34 15.5	12.912
8	13 1 15.53	2.3392	1 47 10.2	12.911
9	13 3 35.94	2.3411	2 0 4.8	12.907
10	13 5 56.46	2.3431	2 12 59.1	12.902
11	13 8 17.11	2.3452	2 25 53.0	12.894
12	13 10 37.88	2.3472	2 38 46.4	12.886
13	13 12 58.78	2.3493	2 51 39.3	12.876
14	13 15 19.80	2.3514	3 4 31.5	12.864
15	13 17 40.95	2.3536	3 17 23.0	12.851
16	13 20 2.23	2.3557	3 30 13.6	12.836
17	13 22 23.64	2.3579	3 43 3.3	12.820
18	13 24 45.18	2.3602	3 55 52.0	12.802
19	13 27 6.86	2.3625	4 8 39.6	12.782
20	13 29 28.68	2.3647	4 21 25.9	12.761
21	13 31 50.63	2.3670	4 34 10.9	12.738
22	13 34 12.72	2.3693	4 46 54.5	12.713
23	13 36 34.95	2.3717	4 59 36.5	12.687
24	13 38 57.23	2.3742	S. 5 12 16.9	12.659

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 38 57.33	2.3742	S. 5 12 16.9	12.659
1	13 41 19.85	2.3766	5 24 55.6	12.630
2	13 43 42.52	2.3790	5 37 32.5	12.599
3	13 46 5.33	2.3814	5 50 7.5	12.567
4	13 48 28.29	2.3839	6 2 40.5	12.532
5	13 50 51.40	2.3864	6 15 11.4	12.496
6	13 53 14.65	2.3888	6 27 40.0	12.458
7	13 55 38.05	2.3914	6 40 6.3	12.419
8	13 58 1.61	2.3940	6 52 30.3	12.378
9	14 0 25.33	2.3966	7 4 51.7	12.335
10	14 2 49.20	2.3991	7 17 10.5	12.292
11	14 5 13.22	2.4017	7 29 26.7	12.247
12	14 7 37.40	2.4042	7 41 40.1	12.199
13	14 10 1.73	2.4068	7 53 50.6	12.150
14	14 12 26.22	2.4095	8 5 58.1	12.099
15	14 14 50.87	2.4122	8 18 2.5	12.047
16	14 17 15.68	2.4148	8 30 3.7	11.993
17	14 19 40.64	2.4174	8 42 1.6	11.937
18	14 22 5.76	2.4200	8 53 56.1	11.879
19	14 24 31.04	2.4227	9 5 47.1	11.821
20	14 26 56.48	2.4253	9 17 34.6	11.761
21	14 29 22.08	2.4280	9 29 18.4	11.698
22	14 31 47.84	2.4307	9 40 58.4	11.635
23	14 34 13.76	2.4333	S. 9 52 34.6	11.571

MONDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 36 39.83	2.4359	S. 10 4 6.9	11.504
1	14 39 6.06	2.4386	10 15 35.1	11.435
2	14 41 32.46	2.4412	10 26 59.1	11.365
3	14 43 59.01	2.4438	10 38 18.9	11.294
4	14 46 25.72	2.4465	10 49 34.4	11.221
5	14 48 52.59	2.4491	11 0 45.4	11.146
6	14 51 19.61	2.4517	11 11 51.9	11.070
7	14 53 46.79	2.4542	11 22 53.8	10.992
8	14 56 14.12	2.4568	11 33 51.0	10.913
9	14 58 41.61	2.4594	11 44 43.4	10.832
10	15 1 9.25	2.4619	11 55 30.9	10.750
11	15 3 37.04	2.4644	12 6 13.4	10.667
12	15 6 4.98	2.4669	12 16 50.9	10.582
13	15 8 33.07	2.4694	12 27 23.2	10.495
14	15 11 1.31	2.4719	12 37 50.3	10.407
15	15 13 29.70	2.4743	12 48 12.1	10.318
16	15 15 58.23	2.4778	12 58 28.5	10.227
17	15 18 26.91	2.4792	13 8 39.4	10.135
18	15 20 55.73	2.4815	13 18 44.7	10.042
19	15 23 24.69	2.4837	13 28 44.4	9.947
20	15 25 53.78	2.4860	13 38 38.3	9.850
21	15 28 23.01	2.4882	13 48 26.4	9.752
22	15 30 52.37	2.4905	13 58 8.6	9.654
23	15 33 21.87	2.4927	14 7 44.9	9.554
24	15 35 51.50	2.4948	S. 14 17 15.1	9.452

TUESDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 35 51.50	2.4948	S. 14 17 15.1	9.452
1	15 38 21.25	2.4969	14 26 39.1	9.349
2	15 40 51.13	2.4990	14 35 57.0	9.246
3	15 43 21.13	2.5010	14 45 8.6	9.140
4	15 45 51.25	2.5029	14 54 13.8	9.033
5	15 48 21.48	2.5048	15 3 12.6	8.926
6	15 50 51.83	2.5067	15 12 4.9	8.817
7	15 53 22.29	2.5085	15 20 50.6	8.707
8	15 55 52.85	2.5102	15 29 29.7	8.596
9	15 58 23.52	2.5120	15 38 2.1	8.484
10	16 0 54.29	2.5137	15 46 27.8	8.371
11	16 3 25.16	2.5152	15 54 46.6	8.256
12	16 5 56.12	2.5167	16 2 58.5	8.140
13	16 8 27.17	2.5182	16 11 3.4	8.024
14	16 10 58.31	2.5197	16 19 1.4	7.907
15	16 13 29.53	2.5210	16 26 52.3	7.789
16	16 16 0.83	2.5223	16 34 36.1	7.670
17	16 18 32.21	2.5236	16 42 12.7	7.549
18	16 21 3.66	2.5247	16 49 42.0	7.428
19	16 23 35.17	2.5257	16 57 4.0	7.306
20	16 26 6.75	2.5268	17 4 18.7	7.183
21	16 28 38.39	2.5278	17 11 26.0	7.059
22	16 31 10.09	2.5287	17 18 25.8	6.935
23	16 33 41.83	2.5294	S. 17 25 18.2	6.811

WEDNESDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	16 36 13.62	2.5301	S. 17 32 3.1	6.685
1	16 38 45.45	2.5308	17 38 40.4	6.558
2	16 41 17.32	2.5314	17 45 10.0	6.430
3	16 43 49.22	2.5319	17 51 32.0	6.302
4	16 46 21.15	2.5324	17 57 46.3	6.173
5	16 48 53.11	2.5328	18 3 52.8	6.044
6	16 51 25.09	2.5331	18 9 51.6	5.915
7	16 53 57.08	2.5332	18 15 42.6	5.784
8	16 56 29.08	2.5333	18 21 25.7	5.653
9	16 59 1.08	2.5333	18 27 1.0	5.522
10	17 1 33.08	2.5333	18 32 28.4	5.390
11	17 4 5.07	2.5332	18 37 47.8	5.258
12	17 6 37.06	2.5330	18 42 59.3	5.126
13	17 9 9.03	2.5327	18 48 2.9	4.992
14	17 11 40.98	2.5322	18 52 58.4	4.858
15	17 14 12.90	2.5317	18 57 45.9	4.725
16	17 16 44.79	2.5312	19 2 25.4	4.591
17	17 19 16.64	2.5306	19 6 56.8	4.457
18	17 21 48.46	2.5299	19 11 20.2	4.322
19	17 24 20.23	2.5290	19 15 35.5	4.187
20	17 26 51.94	2.5281	19 19 42.7	4.052
21	17 29 23.60	2.5272	19 23 41.8	3.917
22	17 31 55.20	2.5260	19 27 32.8	3.782
23	17 34 26.72	2.5247	19 31 15.6	3.646
24	17 36 58.17	2.5235	S. 19 34 50.3	3.511

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 36 58.17	2.5235	S. 19 34 50.3	3.511
1	17 39 29.54	2.5222	19 38 16.9	3.376
2	17 42 0.83	2.5208	19 41 35.4	3.240
3	17 44 32.03	2.5192	19 44 45.7	3.104
4	17 47 3.13	2.5176	19 47 47.9	2.968
5	17 49 34.14	2.5159	19 50 41.9	2.832
6	17 52 5.04	2.5141	19 53 27.8	2.697
7	17 54 35.83	2.5122	19 56 5.6	2.562
8	17 57 6.50	2.5102	19 58 35.3	2.427
9	17 59 37.05	2.5081	20 0 56.8	2.291
10	18 2 7.47	2.5060	20 3 10.2	2.156
11	18 4 37.77	2.5038	20 5 15.5	2.022
12	18 7 7.93	2.5014	20 7 12.8	1.887
13	18 9 37.94	2.4990	20 9 2.0	1.752
14	18 12 7.81	2.4966	20 10 43.1	1.618
15	18 14 37.53	2.4940	20 12 16.2	1.485
16	18 17 7.09	2.4913	20 13 41.3	1.352
17	18 19 36.49	2.4886	20 14 58.4	1.219
18	18 22 5.72	2.4857	20 16 7.5	1.086
19	18 24 34.78	2.4828	20 17 8.7	0.953
20	18 27 3.66	2.4798	20 18 1.9	0.821
21	18 29 32.36	2.4768	20 18 47.2	0.690
22	18 32 0.88	2.4736	20 19 24.7	0.559
23	18 34 29.20	2.4704	S. 20 19 54.3	0.428

FRIDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 36 57.33	2.4672	S. 20 20 16.0	0.297
1	18 39 25.26	2.4638	20 20 29.9	0.167
2	18 41 52.98	2.4603	20 20 36.1	−0.039
3	18 44 20.50	2.4568	20 20 34.6	+0.089
4	18 46 47.80	2.4533	20 20 25.4	0.217
5	18 49 14.89	2.4497	20 20 8.5	0.345
6	18 51 41.76	2.4460	20 19 44.0	0.472
7	18 54 8.41	2.4422	20 19 11.9	0.598
8	18 56 34.82	2.4383	20 18 32.2	0.724
9	18 59 1.00	2.4343	20 17 45.0	0.848
10	19 1 26.94	2.4303	20 16 50.4	0.972
11	19 3 52.64	2.4263	20 15 48.3	1.096
12	19 6 18.10	2.4222	20 14 38.8	1.219
13	19 8 43.31	2.4181	20 13 22.0	1.341
14	19 11 8.27	2.4138	20 11 57.9	1.463
15	19 13 32.97	2.4095	20 10 26.5	1.584
16	19 15 57.41	2.4053	20 8 47.8	1.705
17	19 18 21.60	2.4010	20 7 1.9	1.824
18	19 20 45.53	2.3966	20 5 8.9	1.942
19	19 23 9.19	2.3920	20 3 8.8	2.060
20	19 25 32.57	2.3874	20 1 1.7	2.177
21	19 27 55.68	2.3828	19 58 47.6	2.293
22	19 30 18.51	2.3782	19 56 26.6	2.408
23	19 32 41.06	2.3736	19 53 58.6	2.523
24	19 35 3.34	2.3689	S. 19 51 23.8	2.637

SATURDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 35 3.34	2.3689	S. 19 51 23.8	2.637
1	19 37 25.33	2.3641	19 48 42.2	2.749
2	19 39 47.03	2.3593	19 45 53.9	2.861
3	19 42 8.45	2.3546	19 42 58.9	2.972
4	19 44 29.58	2.3497	19 39 57.2	3.083
5	19 46 50.41	2.3447	19 36 48.9	3.192
6	19 49 10.95	2.3398	19 33 34.1	3.301
7	19 51 31.19	2.3348	19 30 12.8	3.408
8	19 53 51.13	2.3299	19 26 45.1	3.515
9	19 56 10.78	2.3249	19 23 11.0	3.621
10	19 58 30.12	2.3198	19 19 30.6	3.725
11	20 0 49.16	2.3147	19 15 44.0	3.829
12	20 3 7.89	2.3097	19 11 51.1	3.933
13	20 5 26.32	2.3046	19 7 52.0	4.035
14	20 7 44.44	2.2994	19 3 46.9	4.136
15	20 10 2.25	2.2943	18 59 35.7	4.237
16	20 12 19.75	2.2892	18 55 18.5	4.336
17	20 14 36.95	2.2841	18 50 55.4	4.434
18	20 16 53.84	2.2788	18 46 26.4	4.532
19	20 19 10.41	2.2736	18 41 51.6	4.628
20	20 21 26.67	2.2684	18 37 11.0	4.724
21	20 23 42.62	2.2632	18 32 24.7	4.819
22	20 25 58.25	2.2579	18 27 32.7	4.913
23	20 28 13.57	2.2527	S. 18 22 35.1	5.006

SUNDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	20 30 28.57	2.2474	S. 18 17 32.0	5.097
1	20 32 43.26	2.2422	18 12 21.4	5.188
2	20 34 57.63	2.2369	18 7 9.4	5.278
3	20 37 11.69	2.2317	18 1 50.0	5.367
4	20 39 25.44	2.2265	17 56 25.3	5.456
5	20 41 38.87	2.2212	17 50 55.3	5.543
6	20 43 51.99	2.2160	17 45 20.1	5.629
7	20 46 4.79	2.2108	17 39 39.8	5.714
8	20 48 17.28	2.2056	17 33 54.4	5.799
9	20 50 29.46	2.2004	17 28 3.9	5.883
10	20 52 41.33	2.1952	17 22 8.4	5.965
11	20 54 52.88	2.1899	17 16 8.1	6.046
12	20 57 4.12	2.1847	17 10 2.9	6.127
13	20 59 15.05	2.1796	17 3 52.9	6.207
14	21 1 25.67	2.1744	16 57 38.1	6.286
15	21 3 35.98	2.1692	16 51 18.6	6.364
16	21 5 45.98	2.1641	16 44 54.4	6.441
17	21 7 55.67	2.1590	16 38 25.7	6.516
18	21 10 5.06	2.1539	16 31 52.5	6.591
19	21 12 14.14	2.1487	16 25 14.8	6.666
20	21 14 22.92	2.1437	16 18 32.6	6.739
21	21 16 31.40	2.1387	16 11 46.1	6.811
22	21 18 39.57	2.1337	16 4 55.3	6.883
23	21 20 47.44	2.1287	15 58 0.2	6.954
24	21 22 55.02	2.1238	S. 15 51 0.8	7.024

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 21.					**WEDNESDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 22 55.02	2.1238	S. 15 51 0.8	7.024	0	22 59 48.21	1.9292	S. 9 9 24.4	9.414
1	21 25 2.30	2.1188	15 43 57.3	7.092	1	23 1 43.88	1.9263	8 59 58.6	9.446
2	21 27 9.28	2.1139	15 36 49.7	7.160	2	23 3 39.37	1.9234	8 50 30.9	9.477
3	21 29 15.97	2.1091	15 29 38.1	7.227	3	23 5 34.69	1.9206	8 41 1.3	9.508
4	21 31 22.37	2.1042	15 22 22.5	7.293	4	23 7 29.84	1.9178	8 31 29.9	9.538
5	21 33 28.48	2.0994	15 15 2.9	7.358	5	23 9 24.83	1.9152	8 21 56.8	9.567
6	21 35 34.30	2.0946	15 7 39.5	7.423	6	23 11 19.66	1.9125	8 12 21.9	9.596
7	21 37 39.83	2.0898	15 0 12.2	7.487	7	23 13 14.33	1.9098	8 2 45.3	9.624
8	21 39 45.08	2.0851	14 52 41.1	7.549	8	23 15 8.84	1.9072	7 53 7.1	9.651
9	21 41 50.05	2.0805	14 45 6.3	7.611	9	23 17 3.20	1.9047	7 43 27.2	9.678
10	21 43 54.74	2.0758	14 37 27.8	7.672	10	23 18 57.41	1.9022	7 33 45.7	9.704
11	21 45 59.15	2.0712	14 29 45.6	7.733	11	23 20 51.47	1.8998	7 24 2.7	9.729
12	21 48 3.28	2.0666	14 21 59.8	7.792	12	23 22 45.39	1.8975	7 14 18.2	9.754
13	21 50 7.14	2.0621	14 14 10.5	7.851	13	23 24 39.17	1.8952	7 4 32.2	9.778
14	21 52 10.73	2.0575	14 6 17.7	7.908	14	23 26 32.81	1.8929	6 54 44.8	9.802
15	21 54 14.04	2.0529	13 58 21.5	7.965	15	23 28 26.31	1.8907	6 44 56.0	9.825
16	21 56 17.08	2.0485	13 50 21.9	8.021	16	23 30 19.69	1.8886	6 35 5.8	9.848
17	21 58 19.86	2.0442	13 42 19.0	8.076	17	23 32 12.94	1.8864	6 25 14.2	9.871
18	22 0 22.38	2.0398	13 34 12.8	8.131	18	23 34 6.06	1.8843	6 15 21.3	9.892
19	22 2 24.64	2.0354	13 26 3.3	8.184	19	23 35 59.06	1.8823	6 5 27.2	9.912
20	22 4 26.63	2.0310	13 17 50.7	8.237	20	23 37 51.94	1.8804	5 55 31.9	9.932
21	22 6 28.36	2.0268	13 9 34.9	8.289	21	23 39 44.71	1.8786	5 45 35.4	9.952
22	22 8 29.85	2.0227	13 1 16.0	8.340	22	23 41 37.37	1.8767	5 35 37.7	9.971
23	22 10 31.09	2.0186	S. 12 52 54.1	8.391	23	23 43 29.92	1.8749	S. 5 25 38.9	9.989
	TUESDAY 22.					**THURSDAY 24.**			
0	22 12 32.08	2.0144	S. 12 44 29.1	8.441	0	23 45 22.36	1.8732	S. 5 15 39.1	10.006
1	22 14 32.82	2.0103	12 36 1.2	8.489	1	23 47 14.70	1.8715	5 5 38.2	10.023
2	22 16 33.32	2.0062	12 27 30.4	8.537	2	23 49 6.94	1.8698	4 55 36.3	10.040
3	22 18 33.57	2.0022	12 18 56.7	8.585	3	23 50 59.08	1.8682	4 45 33.4	10.056
4	22 20 33.59	1.9983	12 10 20.2	8.632	4	23 52 51.13	1.8667	4 35 29.6	10.071
5	22 22 33.37	1.9944	12 1 40.9	8.678	5	23 54 43.09	1.8653	4 25 24.9	10.086
6	22 24 32.92	1.9906	11 52 58.8	8.723	6	23 56 34.97	1.8639	4 15 19.3	10.100
7	22 26 32.24	1.9868	11 44 14.1	8.767	7	23 58 26.76	1.8625	4 5 12.9	10.114
8	22 28 31.33	1.9830	11 35 26.8	8.810	8	0 0 18.47	1.8612	3 55 5.7	10.127
9	22 30 30.20	1.9792	11 26 36.9	8.854	9	0 2 10.11	1.8600	3 44 57.7	10.139
10	22 32 28.84	1.9756	11 17 44.4	8.897	10	0 4 1.67	1.8588	3 34 49.0	10.151
11	22 34 27.27	1.9720	11 8 49.3	8.939	11	0 5 53.16	1.8577	3 24 39.6	10.162
12	22 36 25.48	1.9684	10 59 51.7	8.979	12	0 7 44.59	1.8566	3 14 29.5	10.173
13	22 38 23.48	1.9649	10 50 51.8	9.018	13	0 9 35.95	1.8555	3 4 18.8	10.183
14	22 40 21.27	1.9614	10 41 49.5	9.058	14	0 11 27.25	1.8545	2 54 7.5	10.193
15	22 42 18.85	1.9580	10 32 44.8	9.097	15	0 13 18.49	1.8535	2 43 55.6	10.202
16	22 44 16.23	1.9546	10 23 37.8	9.135	16	0 15 9.67	1.8527	2 33 43.2	10.211
17	22 46 13.40	1.9512	10 14 28.6	9.172	17	0 17 0.81	1.8519	2 23 30.3	10.219
18	22 48 10.37	1.9479	10 5 17.2	9.208	18	0 18 51.90	1.8511	2 13 16.9	10.227
19	22 50 7.15	1.9447	9 56 3.6	9.244	19	0 20 42.94	1.8503	2 3 3.1	10.233
20	22 52 3.74	1.9416	9 46 47.9	9.279	20	0 22 33.94	1.8497	1 52 48.9	10.239
21	22 54 0.14	1.9384	9 37 30.1	9.314	21	0 24 24.90	1.8491	1 42 34.4	10.244
22	22 55 56.35	1.9353	9 28 10.2	9.348	22	0 26 15.83	1.8485	1 32 19.6	10.250
23	22 57 52.37	1.9322	9 18 48.3	9.382	23	0 28 6.72	1.8479	1 22 4.4	10.256
24	22 59 48.21	1.9292	S. 9 9 24.4	9.414	24	0 29 57.58	1.8475	S. 1 11 48.9	10.260

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 29 57.58	1.8475	S. 1 11 48.9	10.260
1	0 31 48.42	1.8471	1 1 33.2	10.263
2	0 33 39.23	1.8467	0 51 17.4	10.265
3	0 35 30.02	1.8464	0 41 1.4	10.268
4	0 37 20.80	1.8462	0 30 45.2	10.270
5	0 39 11.56	1.8459	0 20 29.0	10.271
6	0 41 2.31	1.8458	S. 0 10 12.7	10.272
7	0 42 53.05	1.8457	N. 0 0 3.6	10.272
8	0 44 43.79	1.8457	0 10 19.9	10.272
9	0 46 34.53	1.8457	0 20 36.2	10.271
10	0 48 25.27	1.8457	0 30 52.4	10.269
11	0 50 16.01	1.8458	0 41 8.4	10.266
12	0 52 6.76	1.8459	0 51 24.3	10.263
13	0 53 57.52	1.8461	1 1 40.0	10.260
14	0 55 48.29	1.8463	1 11 55.5	10.257
15	0 57 39.08	1.8467	1 22 10.8	10.253
16	0 59 29.89	1.8470	1 32 25.8	10.248
17	1 1 20.72	1.8473	1 42 40.5	10.242
18	1 3 11.57	1.8477	1 52 54.8	10.235
19	1 5 2.45	1.8482	2 3 8.7	10.229
20	1 6 53.36	1.8488	2 13 22.2	10.222
21	1 8 44.31	1.8495	2 23 35.3	10.214
22	1 10 35.30	1.8502	2 33 47.9	10.205
23	1 12 26.33	1.8508	N. 2 43 59.9	10.196

SATURDAY 26

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 14 17.39	1.8514	N. 2 54 11.4	10.187
1	1 16 8.50	1.8522	3 4 22.3	10.177
2	1 17 59.66	1.8531	3 14 32.6	10.166
3	1 19 50.88	1.8541	3 24 42.2	10.154
4	1 21 42.15	1.8550	3 34 51.1	10.142
5	1 23 33.48	1.8559	3 44 59.3	10.130
6	1 25 24.86	1.8569	3 55 6.7	10.117
7	1 27 16.31	1.8581	4 5 13.3	10.103
8	1 29 7.83	1.8592	4 15 19.1	10.089
9	1 30 59.41	1.8603	4 25 24.0	10.074
10	1 32 51.06	1.8615	4 35 28.0	10.058
11	1 34 42.79	1.8628	4 45 31.0	10.042
12	1 36 34.60	1.8642	4 55 33.0	10.025
13	1 38 26.49	1.8655	5 5 34.0	10.008
14	1 40 18.46	1.8668	5 15 34.0	9.991
15	1 42 10.51	1.8682	5 25 32.9	9.972
16	1 44 2.65	1.8697	5 35 30.6	9.953
17	1 45 54.88	1.8713	5 45 27.2	9.933
18	1 47 47.21	1.8730	5 55 22.6	9.912
19	1 49 39.64	1.8746	6 5 16.7	9.892
20	1 51 32.16	1.8762	6 15 9.6	9.871
21	1 53 24.78	1.8778	6 25 1.2	9.848
22	1 55 17.50	1.8795	6 34 51.4	9.825
23	1 57 10.32	1.8813	6 44 40.2	9.801
24	1 59 3.25	1.8832	N. 6 54 27.5	9.777

SUNDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 59 3.25	1.8832	N. 6 54 27.5	9.777
1	2 0 56.30	1.8851	7 4 13.4	9.752
2	2 2 49.46	1.8869	7 13 57.8	9.727
3	2 4 42.73	1.8888	7 23 40.6	9.701
4	2 6 36.12	1.8909	7 33 21.9	9.674
5	2 8 29.64	1.8930	7 43 1.5	9.647
6	2 10 23.28	1.8950	7 52 39.5	9.619
7	2 12 17.04	1.8971	8 2 15.8	9.590
8	2 14 10.93	1.8993	8 11 50.3	9.561
9	2 16 4.96	1.9016	8 21 23.1	9.532
10	2 17 59.12	1.9038	8 30 54.1	9.501
11	2 19 53.41	1.9060	8 40 23.2	9.469
12	2 21 47.84	1.9083	8 49 50.4	9.437
13	2 23 42.41	1.9107	8 59 15.6	9.404
14	2 25 37.12	1.9130	9 8 38.9	9.371
15	2 27 31.97	1.9154	9 18 0.2	9.337
16	2 29 26.97	1.9179	9 27 19.4	9.302
17	2 31 22.12	1.9204	9 36 36.5	9.267
18	2 33 17.42	1.9229	9 45 51.5	9.232
19	2 35 12.87	1.9255	9 55 4.3	9.195
20	2 37 8.48	1.9281	10 4 14.9	9.157
21	2 39 4.25	1.9307	10 13 23.2	9.119
22	2 41 0.17	1.9333	10 22 29.2	9.080
23	2 42 56.25	1.9361	N.10 31 32.8	9.040

MONDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	2 44 52.50	1.9388	N.10 40 34.0	9.000
1	2 46 48.91	1.9416	10 49 32.8	8.959
2	2 48 45.49	1.9444	10 58 29.1	8.918
3	2 50 42.24	1.9472	11 7 22.9	8.876
4	2 52 39.16	1.9501	11 16 14.2	8.833
5	2 54 36.25	1.9529	11 25 2.9	8.790
6	2 56 33.51	1.9558	11 33 49.0	8.746
7	2 58 30.95	1.9588	11 42 32.4	8.700
8	3 0 28.57	1.9617	11 51 13.0	8.654
9	3 2 26.36	1.9647	11 59 50.9	8.607
10	3 4 24.33	1.9678	12 8 25.9	8.560
11	3 6 22.49	1.9709	12 16 58.1	8.512
12	3 8 20.84	1.9740	12 25 27.4	8.464
13	3 10 19.37	1.9770	12 33 53.8	8.415
14	3 12 18.08	1.9801	12 42 17.2	8.364
15	3 14 16.98	1.9832	12 50 37.5	8.313
16	3 16 16.07	1.9864	12 58 54.7	8.261
17	3 18 15.35	1.9897	13 7 8.8	8.208
18	3 20 14.83	1.9929	13 15 19.7	8.155
19	3 22 14.50	1.9961	13 23 27.4	8.102
20	3 24 14.36	1.9994	13 31 31.9	8.047
21	3 26 14.42	2.0027	13 39 33.1	7.992
22	3 28 14.68	2.0060	13 47 30.9	7.936
23	3 30 15.14	2.0092	13 55 25.4	7.880
24	3 32 15.79	2.0125	N.14 3 16.5	7.822

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 32 15.79	2.0125	N.14 3 16.5	7.822
1	3 34 16.64	2.0159	14 11 4.1	7.763
2	3 36 17.70	2.0193	14 18 48.1	7.704
3	3 38 18.96	2.0227	14 26 28.6	7.644
4	3 40 20.42	2.0261	14 34 5.4	7.583
5	3 42 22.09	2.0295	14 41 38.6	7.522
6	3 44 23.96	2.0328	14 49 8.1	7.461
7	3 46 26.03	2.0362	14 56 33.9	7.398
8	3 48 28.31	2.0397	15 3 55.9	7.334
9	3 50 30.80	2.0432	15 11 14.0	7.269
10	3 52 33.50	2.0467	15 18 28.2	7.204
11	3 54 36.41	2.0502	15 25 38.5	7.139
12	3 56 39.52	2.0536	15 32 44.9	7.073
13	3 58 42.84	2.0572	15 39 47.3	7.006
14	4 0 46.38	2.0607	15 46 45.6	6.937
15	4 2 50.12	2.0641	15 53 39.7	6.867
16	4 4 54.07	2.0676	16 0 29.7	6.798
17	4 6 58.23	2.0712	16 7 15.5	6.728
18	4 9 2.61	2.0747	16 13 57.1	6.657
19	4 11 7.20	2.0782	16 20 34.4	6.586
20	4 13 11.99	2.0816	16 27 7.4	6.513
21	4 15 16.99	2.0851	16 33 36.0	6.440
22	4 17 22.20	2.0887	16 40 0.2	6.366
23	4 19 27.63	2.0922	N.16 46 19.9	6.291

WEDNESDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	4 21 33.27	2.0957	N.16 52 35.1	6.215
1	4 23 39.12	2.0992	16 58 45.7	6.139
2	4 25 45.18	2.1027	17 4 51.8	6.063
3	4 27 51.44	2.1062	17 10 53.3	5.986
4	4 29 57.92	2.1097	17 16 50.1	5.907
5	4 32 4.61	2.1132	17 22 42.1	5.827
6	4 34 11.50	2.1166	17 28 29.3	5.747
7	4 36 18.60	2.1201	17 34 11.7	5.667
8	4 38 25.91	2.1236	17 39 49.3	5.586
9	4 40 33.42	2.1270	17 45 22.0	5.503
10	4 42 41.15	2.1303	17 50 49.7	5.420
11	4 44 49.07	2.1337	17 56 12.4	5.337
12	4 46 57.20	2.1372	18 1 30.2	5.254
13	4 49 5.53	2.1406	18 6 42.9	5.169
14	4 51 14.07	2.1440	18 11 50.5	5.083
15	4 53 22.81	2.1473	18 16 52.9	4.997
16	4 55 31.75	2.1506	18 21 50.1	4.910
17	4 57 40.89	2.1539	18 26 42.1	4.822
18	4 59 50.22	2.1572	18 31 28.8	4.734
19	5 1 59.75	2.1605	18 36 10.2	4.646
20	5 4 9.48	2.1637	18 40 46.3	4.557
21	5 6 19.40	2.1670	18 45 17.0	4.467
22	5 8 29.52	2.1702	18 49 42.3	4.376
23	5 10 39.83	2.1734	18 54 2.1	4.284
24	5 12 50.33	2.1766	N.18 58 16.4	4.192

THURSDAY, DECEMBER 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	5 12 50.33	2.1766	N.18 58 16.4	4.192

PHASES OF THE MOON.

		d	h	m
☾ Last Quarter . .	Nov.	8	5	1.9
● New Moon		14	20	8.3
☽ First Quarter . . .		21	22	43.0
○ Full Moon		30	3	20.1

		d	h
☾ Perigee	Nov.	13	17.4
☾ Apogee		25	20.8

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Fomalhaut	W.	72° 28′ 19″	3302	73° 52′ 28″	3294	75° 16′ 47″	3286	76° 41′ 15″	3277
	α Pegasi	W.	57 58 30	3499	59 18 55	3480	60 39 41	3463	62 0 47	3446
	Pollux	E.	67 9 42	3078	65 41 5	3075	64 12 25	3072	62 43 41	3069
	SATURN	E.	80 56 50	3030	79 27 15	3026	77 57 35	3022	76 27 50	3018
	Regulus	E.	102 51 21	3019	101 21 32	3015	99 51 38	3011	98 21 39	3006
2	Fomalhaut	W.	83 45 51	3242	85 11 11	3236	86 36 38	3229	88 2 13	3222
	α Pegasi	W.	68 50 41	3373	70 13 28	3361	71 36 29	3349	72 59 44	3337
	α Arietis	W.	25 56 37	3854	27 10 44	3763	28 26 25	3684	29 43 29	3615
	Pollux	E.	55 19 12	3056	53 50 9	3053	52 21 2	3051	50 51 52	3049
	SATURN	E.	68 57 35	2993	67 27 13	2987	65 56 44	2981	64 26 8	2976
	Regulus	E.	90 50 14	2981	89 19 38	2977	87 48 56	2971	86 18 7	2965
3	α Pegasi	W.	79 59 11	3285	81 23 40	3276	82 48 20	3267	84 13 10	3258
	α Arietis	W.	36 24 57	3371	37 47 47	3335	39 11 18	3302	40 35 27	3273
	Pollux	E.	43 25 32	3043	41 56 12	3043	40 26 52	3043	38 57 33	3044
	SATURN	E.	56 51 18	2945	55 19 56	2939	53 48 26	2931	52 16 47	2925
	Regulus	E.	78 42 12	2935	77 10 38	2928	75 38 55	2921	74 7 3	2915
	MARS	E.	92 16 36	3145	90 49 21	3138	89 21 57	3130	87 54 24	3124
	VENUS	E.	108 20 9	3192	106 53 50	3186	105 27 24	3180	104 0 51	3173
4	α Arietis	W.	47 44 12	3150	49 11 21	3129	50 38 55	3110	52 6 52	3091
	Pollux	E.	31 31 48	3070	30 3 2	3080	28 34 28	3094	27 6 11	3112
	SATURN	E.	44 36 17	2887	43 3 42	2879	41 30 56	2870	39 57 59	2862
	Regulus	E.	66 25 29	2877	64 52 41	2869	63 19 43	2861	61 46 34	2852
	MARS	E.	80 34 26	3084	79 5 57	3075	77 37 17	3067	76 8 27	3058
	VENUS	E.	96 45 58	3136	95 18 32	3129	93 50 57	3121	92 23 13	3113
	SUN	E.	139 40 25	3284	138 15 55	3273	136 51 12	3262	135 26 16	3252
5	α Arietis	W.	59 32 6	3006	61 2 11	2991	62 32 35	2976	64 3 18	2960
	Aldebaran	W.	26 11 38	2609	27 45 54	2799	29 20 23	2789	30 55 5	2779
	SATURN	E.	32 10 29	2817	30 36 23	2808	29 2 5	2798	27 27 34	2788
	Regulus	E.	53 58 0	2807	52 23 41	2798	50 49 10	2788	49 14 26	2777
	MARS	E.	68 41 27	3010	67 11 27	3000	65 41 14	2989	64 10 48	2978
	VENUS	E.	85 1 55	3068	83 33 6	3059	82 4 6	3049	80 34 54	3039
	SUN	E.	128 18 24	3195	126 52 9	3184	125 25 41	3173	123 58 59	3160
6	α Arietis	W.	71 41 39	2887	73 14 14	2873	74 47 8	2859	76 20 20	2845
	Aldebaran	W.	38 52 8	2723	40 28 17	2712	42 4 41	2700	43 41 21	2688
	Regulus	E.	41 17 18	2723	39 41 9	2711	38 4 44	2700	36 28 4	2688
	MARS	E.	56 35 9	2921	55 3 17	2909	53 31 10	2898	51 58 48	2885
	VENUS	E.	73 5 40	2985	71 35 9	2973	70 4 23	2962	68 33 22	2950
	Spica	E.	95 7 8	2752	93 31 37	2741	91 55 51	2729	90 19 49	2716
	SUN	E.	116 41 49	3098	115 13 37	3086	113 45 10	3073	112 16 27	3059
7	α Arietis	W.	84 10 55	2774	85 45 57	2760	87 21 19	2747	88 56 55	2732
	Aldebaran	W.	51 48 50	2624	53 27 12	2611	55 5 52	2597	56 44 51	2584
	MARS	E.	44 12 48	2818	42 38 44	2805	41 4 22	2791	39 29 42	2776
	VENUS	E.	60 54 32	2888	59 21 58	2875	57 49 7	2862	56 15 59	2848
	Spica	E.	82 15 36	2654	80 37 54	2641	78 59 55	2628	77 21 38	2615
	SUN	E.	104 48 35	2989	103 18 9	2974	101 47 24	2959	100 16 20	2944

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Fomalhaut	W.	78° 5′ 53″	3270	79° 30′ 40″	3263	80° 55′ 35″	3255	82° 20′ 39″	3248
	α Pegasi	W.	63 22 11	3431	64 43 53	3415	66 5 53	3400	67 28 9	3386
	Pollux	E.	61 14 54	3066	59 46 3	3064	58 17 9	3061	56 48 12	3059
	Saturn	E.	74 57 59	3013	73 28 2	3008	71 57 59	3003	70 27 50	2998
	Regulus	E.	96 51 34	3001	95 21 23	2997	93 51 6	2992	92 20 43	2987
2	Fomalhaut	W.	89 27 56	3216	90 53 46	3211	92 19 42	3205	93 45 45	3199
	α Pegasi	W.	74 23 13	3326	75 46 54	3316	77 10 47	3305	78 34 53	3294
	α Arietis	W.	31 1 47	3555	32 21 11	3500	33 41 35	3453	35 2 52	3410
	Pollux	E.	49 22 40	3047	47 53 26	3046	46 24 10	3044	44 54 52	3043
	Saturn	E.	62 55 25	2969	61 24 34	2964	59 53 36	2958	58 22 31	2952
	Regulus	E.	84 47 11	2960	83 16 8	2954	81 44 57	2947	80 13 38	2942
3	α Pegasi	W.	85 38 11	3249	87 3 22	3241	88 28 43	3234	89 54 12	3226
	α Arietis	W.	42 0 10	3245	43 25 26	3219	44 51 13	3194	46 17 29	3172
	Pollux	E.	37 28 15	3047	35 59 0	3050	34 29 49	3055	33 0 44	3062
	Saturn	E.	50 45 0	2918	49 13 4	2910	47 40 58	2902	46 8 42	2895
	Regulus	E.	72 35 3	2908	71 2 54	2900	69 30 35	2893	67 58 7	2885
	Mars	E.	86 26 43	3116	84 58 53	3109	83 30 54	3101	82 2 45	3092
	Venus	E.	102 34 10	3166	101 7 20	3158	99 40 21	3152	98 13 14	3144
4	α Arietis	W.	53 35 12	3073	55 3 54	3056	56 32 57	3039	58 2 21	3022
	Pollux	E.	25 38 16	3134	24 10 48	3163	22 43 55	3199	21 17 45	3247
	Saturn	E.	38 24 52	2854	36 51 34	2845	35 18 4	2835	33 44 22	2827
	Regulus	E.	60 13 14	2844	58 39 43	2835	57 6 1	2826	55 32 7	2816
	Mars	E.	74 39 26	3048	73 10 13	3039	71 40 49	3030	70 11 14	3021
	Venus	E.	90 55 19	3104	89 27 14	3096	87 58 59	3087	86 30 33	3077
	Sun	E.	134 1 8	3241	132 35 47	3230	131 10 13	3218	129 44 25	3207
5	α Arietis	W.	65 34 21	2945	67 5 43	2931	68 37 23	2916	70 9 22	2901
	Aldebaran	W.	32 30 1	2768	34 5 11	2757	35 40 35	2746	37 16 14	2735
	Saturn	E.	25 52 50	2777	24 17 52	2767	22 42 41	2757	21 7 17	2747
	Regulus	E.	47 39 28	2767	46 4 17	2756	44 28 52	2745	42 53 12	2735
	Mars	E.	62 40 8	2968	61 9 15	2957	59 38 8	2945	58 6 46	2933
	Venus	E.	79 5 29	3028	77 35 51	3018	76 6 0	3008	74 35 57	2997
	Sun	E.	122 32 2	3148	121 4 51	3136	119 37 25	3124	118 9 45	3111
6	α Arietis	W.	77 53 50	2830	79 27 39	2816	81 1 46	2802	82 36 11	2788
	Aldebaran	W.	45 18 17	2676	46 55 29	2663	48 32 58	2650	50 10 45	2637
	Regulus	E.	34 51 8	2676	33 13 56	2663	31 36 27	2651	29 58 41	2638
	Mars	E.	50 26 10	2872	48 53 15	2859	47 20 3	2845	45 46 34	2832
	Venus	E.	67 2 7	2938	65 30 36	2926	63 58 50	2914	62 26 49	2901
	Spica	E.	88 43 31	2704	87 6 57	2692	85 30 7	2680	83 53 0	2667
	Sun	E.	110 47 27	3045	109 18 10	3031	107 48 36	3017	106 18 44	3003
7	α Arietis	W.	90 32 52	2719	92 9 7	2705	93 45 40	2692	95 22 31	2678
	Aldebaran	W.	58 24 8	2570	60 3 44	2556	61 43 40	2541	63 23 56	2527
	Mars	E.	37 54 43	2762	36 19 25	2747	34 43 48	2732	33 7 51	2718
	Venus	E.	54 42 33	2835	53 8 50	2821	51 34 50	2808	50 0 32	2793
	Spica	E.	75 43 3	2601	74 4 10	2588	72 24 58	2574	70 45 27	2561
	Sun	E.	98 44 57	2929	97 13 15	2914	95 41 14	2898	94 8 53	2883

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LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
8	Aldebaran	W.	65° 4′ 31″	2513	66° 45′ 26″	2498	68° 26′ 42″	2483	70° 8′ 19″	2468
	Pollux	W.	22 30 24	2846	24 3 52	2789	25 38 34	2741	27 14 20	2698
	MARS	E.	31 31 35	2703	29 54 59	2688	28 18 3	2672	26 40 46	2657
	VENUS	E.	48 25 55	2779	46 51 0	2766	45 15 47	2751	43 40 15	2737
	Spica	E.	69 5 38	2547	67 25 30	2533	65 45 3	2520	64 4 17	2505
	SUN	E.	92 36 12	2868	91 3 12	2852	89 29 51	2835	87 56 9	2820
9	Aldebaran	W.	78 41 41	2393	80 25 26	2378	82 9 32	2363	83 54 0	2348
	Pollux	W.	35 25 50	2535	37 6 14	2509	38 47 15	2485	40 28 50	2460
	SATURN	W.	20 17 49	2403	22 1 20	2387	23 45 14	2371	25 29 30	2355
	VENUS	E.	35 37 54	2668	34 0 31	2655	32 22 50	2641	30 44 51	2629
	Spica	E.	55 35 36	2438	53 52 55	2424	52 9 55	2412	50 26 37	2399
	SUN	E.	80 2 26	2739	78 26 38	2722	76 50 28	2707	75 13 57	2691
10	Aldebaran	W.	92 41 50	2273	94 28 29	2258	96 15 30	2244	98 2 52	2230
	Pollux	W.	49 4 42	2356	50 49 20	2337	52 34 25	2320	54 19 56	2302
	SATURN	W.	34 16 31	2279	36 3 2	2264	37 49 54	2249	39 37 8	2235
	Spica	E.	41 45 47	2343	40 0 50	2334	38 15 40	2326	36 30 18	2318
	SUN	E.	67 6 2	2612	65 27 24	2597	63 48 25	2583	62 9 6	2567
11	Pollux	W.	63 13 40	2223	65 1 34	2206	66 49 49	2194	68 38 25	2182
	SATURN	W.	48 38 33	2167	50 27 51	2155	52 17 27	2143	54 7 21	2131
	Regulus	W.	26 57 0	2165	28 46 21	2151	30 36 2	2139	32 26 2	2128
	SUN	E.	53 47 35	2500	52 6 22	2488	50 24 52	2476	48 43 5	2465
12	Pollux	W.	77 46 1	2125	79 36 22	2116	81 26 57	2107	83 17 46	2099
	SATURN	W.	63 21 11	2078	65 12 44	2070	67 4 30	2061	68 56 29	2053
	Regulus	W.	41 40 15	2075	43 31 52	2066	45 23 43	2059	47 15 46	2051
	SUN	E.	40 10 38	2421	38 27 33	2415	36 44 20	2410	35 0 59	2405
16	SUN	W.	16 45 19	2626	18 23 39	2607	20 2 24	2598	21 41 22	2595
	Fomalhaut	E.	84 26 6	2387	82 42 12	2402	80 58 40	2417	79 15 30	2435
	α Pegasi	E.	99 40 56	2482	97 59 17	2492	96 17 52	2503	94 36 43	2515
17	SUN	W.	29 55 32	2628	31 33 49	2640	33 11 49	2654	34 49 31	2669
	Fomalhaut	E.	70 46 16	2537	69 5 54	2560	67 26 4	2584	65 46 47	2610
	α Pegasi	E.	86 15 44	2593	84 36 39	2612	82 58 0	2632	81 19 48	2652
18	SUN	W.	42 52 49	2752	44 28 20	2769	46 3 28	2788	47 38 12	2807
	Fomalhaut	E.	57 39 42	2758	56 4 19	2792	54 29 41	2828	52 55 49	2866
	α Pegasi	E.	73 16 9	2769	71 41 1	2796	70 6 28	2823	68 32 30	2852
19	SUN	W.	55 25 41	2903	56 57 56	2922	58 29 47	2942	60 1 13	2963
	Fomalhaut	E.	45 19 18	3086	43 50 51	3139	42 23 29	3196	40 57 15	3258
	α Pegasi	E.	60 52 13	3009	59 22 12	3045	57 52 55	3082	56 24 24	3120
20	SUN	W.	67 32 20	3056	69 1 23	3074	70 30 4	3093	71 58 22	3111
	Fomalhaut	E.	34 6 3	3659	32 48 32	3767	31 32 55	3887	30 19 22	4023
	α Pegasi	E.	49 14 3	3343	47 50 41	3394	46 28 18	3450	45 6 58	3509
	α Arietis	E.	90 33 3	2834	88 59 19	2851	87 25 57	2869	85 52 58	2886
21	SUN	W.	79 14 33	3197	80 40 46	3213	82 6 40	3228	83 32 16	3242

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Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
8	Aldebaran	W.	71 50 17	2453	73 32 36	2438	75 15 16	2423	76 58 18	2408
	Pollux	W.	28 51 2	2660	30 28 36	2624	32 6 58	2592	33 46 4	2563
	Mars	E.	25 3 9	2643	23 25 12	2627	21 46 54	2612	20 8 15	2597
	Venus	E.	42 4 24	2722	40 28 14	2709	38 51 46	2695	37 14 59	2681
	Spica	E.	62 23 11	2492	60 41 46	2478	59 0 2	2465	57 17 59	2450
	Sun	E.	86 22 7	2804	84 47 44	2787	83 12 59	2771	81 37 53	2755
9	Aldebaran	W.	85 38 50	2333	87 24 2	2317	89 9 36	2302	90 55 32	2287
	Pollux	W.	42 10 59	2438	43 53 40	2417	45 36 51	2396	47 20 32	2375
	Saturn	W.	27 14 9	2339	28 59 11	2324	30 44 35	2309	32 30 22	2294
	Venus	E.	29 6 36	2617	27 28 4	2606	25 49 17	2596	24 10 16	2587
	Spica	E.	48 43 1	2387	46 59 7	2375	45 14 56	2364	43 30 29	2353
	Sun	E	73 37 5	2675	71 59 52	2659	70 22 17	2643	68 44 20	2627
10	Aldebaran	W.	99 50 35	2216	101 38 39	2202	103 27 3	2189	105 15 47	2176
	Pollux	W.	56 5 52	2285	57 52 13	2268	59 38 59	2253	61 26 8	2237
	Saturn	W.	41 24 44	2220	43 12 41	2207	45 0 58	2194	46 49 35	2180
	Spica	E..	34 44 45	2313	32 59 5	2310	31 13 20	2308	29 27 32	2309
	Sun	E.	60 29 26	2553	58 49 26	2539	57 9 7	2526	55 28 30	2513
11	Pollux	W.	70 27 20	2169	72 16 34	2157	74 6 6	2146	75 55 55	2135
	Saturn	W.	55 57 33	2119	57 48 3	2108	59 38 50	2098	61 29 53	2088
	Regulus	W.	34 16 19	2116	36 6 54	2105	37 57 46	2095	39 48 53	2085
	Sun	E.	47 1 3	2455	45 18 46	2445	43 36 16	2436	41 53 33	2428
12	Pollux	W.	85 8 47	2092	86 59 59	2085	88 51 21	2079	90 42 53	2073
	Saturn	W.	70 48 40	2046	72 41 3	2039	74 33 36	2034	76 26 17	2029
	Regulus	W.	49 8 1	2043	51 0 28	2037	52 53 5	2032	54 45 50	2026
	Sun	E.	33 17 32	2403	31 34 2	2403	29 50 31	2403	28 7 1	2406
16	Sun	W.	23 20 24	2596	24 59 24	2601	26 38 17	2608	28 17 1	2618
	Fomalhaut	E.	77 32 45	2453	75 50 26	2472	74 8 34	2492	72 27 10	2514
	α Pegasi	E.	92 55 51	2529	91 15 18	2544	89 35 5	2559	87 55 13	2575
17	Sun	W.	36 26 53	2684	38 3 55	2690	39 40 36	2716	41 16 54	2734
	Fomalhaut	E.	64 8 5	2637	62 30 0	2666	60 52 34	2695	59 15 47	2726
	α Pegasi	E.	79 42 4	2674	78 4 49	2696	76 28 4	2719	74 51 50	2744
18	Sun	W.	49 12 31	2825	50 46 26	2845	52 19 56	2864	53 53 1	2883
	Fomalhaut	E.	51 22 46	2905	49 50 33	2946	48 19 12	2989	46 48 46	3036
	α Pegasi	E.	66 59 9	2881	65 26 26	2911	63 54 21	2942	62 22 56	2976
19	Sun	W.	61 32 14	2981	63 2 51	3000	64 33 4	3018	66 2 54	3038
	Fomalhaut	E.	39 32 14	3325	38 8 31	3397	36 46 11	3475	35 25 19	3562
	α Pegasi	E.	54 56 39	3160	53 29 42	3203	52 3 36	3247	50 38 22	3294
20	Sun	W.	73 26 18	3129	74 53 53	3146	76 21 7	3163	77 48 0	3180
	Fomalhaut	E.	29 8 5	4178	27 59 18	4354	26 53 15	4556	25 50 12	4791
	α Pegasi	E.	43 46 44	3572	42 27 39	3640	41 9 48	3713	39 53 15	3793
	α Arietis	E.	84 20 21	2903	82 48 6	2921	81 16 14	2938	79 44 43	2955
21	Sun	W.	84 57 35	3258	86 22 36	3272	87 47 20	3287	89 11 47	3300

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LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
21	α Aquilæ	W.	34° 21′ 43″	5294	35° 14′ 55″	5114	36° 10′ 22″	4957	37° 7′ 51″	4820
	α Arietis	E.	78 13 34	2972	76 42 46	2989	75 12 20	3006	73 42 15	3022
22	Sun	W.	90 35 58	3313	91 59 54	3325	93 23 36	3338	94 47 3	3350
	α Aquilæ	W.	42 19 49	4338	43 26 7	4269	44 33 28	4210	45 41 45	4156
	α Arietis	E.	66 16 56	3105	64 48 52	3121	63 21 8	3138	61 53 44	3154
	Aldebaran	E.	97 31 51	2923	96 0 1	2935	94 28 26	2946	92 57 5	2956
23	Sun	W.	101 41 8	3401	103 3 23	3410	104 25 28	3419	105 47 23	3427
	α Aquilæ	W.	51 34 31	3956	52 46 54	3926	53 59 47	3900	55 13 7	3875
	α Arietis	E.	54 41 38	3236	53 16 12	3254	51 51 7	3272	50 26 23	3290
	Aldebaran	E.	85 23 31	3003	83 53 22	3011	82 23 23	3019	80 53 34	3026
24	Sun	W.	112 34 55	3459	113 56 5	3464	115 17 9	3470	116 38 7	3474
	α Aquilæ	W.	61 25 23	3780	62 40 46	3766	63 56 24	3751	65 12 17	3739
	α Arietis	E.	43 28 17	3394	42 5 54	3418	40 43 58	3445	39 22 32	3473
	Aldebaran	E.	73 26 28	3056	71 57 24	3060	70 28 25	3063	68 59 30	3066
25	Sun	W.	123 21 57	3488	124 42 34	3490	126 3 9	3491	127 23 43	3493
	α Aquilæ	W.	71 34 44	3687	72 51 45	3678	74 8 55	3670	75 26 14	3663
	Fomalhaut	W.	37 15 58	3826	38 30 33	3779	39 45 57	3737	41 2 5	3699
	Aldebaran	E.	61 35 50	3078	60 7 14	3079	58 38 39	3080	57 10 5	3080
26	α Aquilæ	W.	81 54 40	3632	83 12 41	3626	84 30 47	3622	85 48 58	3617
	Fomalhaut	W.	47 31 43	3553	48 51 9	3530	50 11 0	3509	51 31 14	3489
	α Pegasi	W.	35 18 27	4292	36 25 27	4206	37 33 47	4130	38 43 20	4062
	Aldebaran	E.	49 47 11	3076	48 18 32	3074	46 49 51	3073	45 21 8	3070
	Pollux	E.	93 55 49	3123	92 28 7	3121	91 0 23	3119	89 32 36	3116
27	Fomalhaut	W.	58 17 38	3403	59 39 51	3389	61 2 20	3374	62 25 6	3361
	α Pegasi	W.	44 46 7	3797	46 1 12	3757	47 16 59	3720	48 33 25	3685
	Aldebaran	E.	37 56 41	3054	36 27 35	3050	34 58 24	3046	33 29 8	3041
	Pollux	E.	82 12 51	3101	80 44 42	3096	79 16 28	3093	77 48 10	3089
	Saturn	E.	96 20 32	3047	94 51 17	3042	93 21 56	3038	91 52 30	3033
28	Fomalhaut	W.	69 22 37	3300	70 46 49	3288	72 11 14	3278	73 35 51	3268
	α Pegasi	W.	55 4 10	3541	56 23 49	3517	57 43 54	3495	59 4 24	3473
	Pollux	E.	70 25 21	3066	68 56 30	3061	67 27 33	3056	65 58 30	3052
	Saturn	E.	84 23 47	3006	82 53 42	3001	81 23 30	2994	79 53 10	2988
29	Fomalhaut	W.	80 41 54	3219	82 7 41	3210	83 33 38	3202	84 59 45	3193
	α Pegasi	W.	65 52 32	3380	67 15 11	3365	68 38 8	3349	70 1 23	3335
	Pollux	E.	58 31 48	3028	57 2 10	3023	55 32 26	3018	54 2 36	3014
	Saturn	E.	72 19 30	2955	70 48 21	2948	69 17 3	2941	67 45 36	2934
	Regulus	E.	94 6 2	2962	92 35 2	2955	91 3 53	2949	89 32 36	2942
30	Fomalhaut	W.	92 12 44	3156	93 39 46	3148	95 6 57	3142	96 34 16	3136
	α Pegasi	W.	77 1 37	3270	78 26 24	3258	79 51 25	3247	81 16 39	3236
	α Arietis	W.	33 32 22	3420	34 54 16	3373	36 17 3	3332	37 40 37	3294
	Pollux	E.	46 32 10	2996	45 1 52	2993	43 31 31	2991	42 1 7	2989
	Saturn	E.	60 6 1	2897	58 33 38	2889	57 1 5	2881	55 28 22	2873
	Regulus	E.	81 53 53	2905	80 21 40	2897	78 49 17	2890	77 16 45	2882

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21	α Aquilæ	W.	38° 7′ 11″	4698	39° 8′ 12″	4592	40° 10′ 44″	4497	41° 14′ 39″	4412
	α Arietis	E.	72 12 30	3039	70 43 6	3056	69 14 3	3073	67 45 20	3088
22	Sun	W.	96 10 17	3361	97 33 18	3372	98 56 7	3383	100 18 43	3393
	α Aquilæ	W.	46 50 53	4108	48 0 47	4064	49 11 24	4024	50 22 40	3988
	α Arietis	E.	60 26 40	3170	58 59 55	3187	57 33 30	3203	56 7 24	3220
	Aldebaran	E.	91 25 57	2966	89 55 2	2977	88 24 20	2986	86 53 50	2995
23	Sun	W.	107 9 9	3434	108 30 47	3441	109 52 17	3448	111 13 39	3454
	α Aquilæ	W.	56 26 52	3853	57 41 0	3832	58 55 29	3814	60 10 17	3796
	α Arietis	E.	49 2 0	3309	47 37 59	3329	46 14 21	3350	44 51 7	3371
	Aldebaran	E.	79 23 53	3032	77 54 20	3039	76 24 55	3045	74 55 38	3051
24	Sun	W.	117 59 0	3478	119 19 49	3480	120 40 35	3484	122 1 17	3486
	α Aquilæ	W.	66 28 23	3727	67 44 42	3716	69 1 12	3706	70 17 53	3696
	α Arietis	E.	38 1 38	3504	36 41 18	3538	35 21 36	3576	34 2 35	3617
	Aldebaran	E.	67 30 39	3069	66 1 52	3073	64 33 9	3074	63 4 28	3077
25	Sun	W.	128 44 15	3494	130 4 46	3494	131 25 17	3494	132 45 48	3494
	α Aquilæ	W.	76 43 41	3656	78 1 15	3649	79 18 57	3643	80 36 45	3636
	Fomalhaut	W.	42 18 53	3665	43 36 17	3634	44 54 15	3605	46 12 44	3577
	Aldebaran	E.	55 41 31	3080	54 12 57	3080	52 44 23	3079	51 15 48	3078
26	α Aquilæ	W.	87 7 14	3613	88 25 34	3609	89 43 59	3606	91 2 27	3602
	Fomalhaut	W.	52 51 50	3470	54 12 48	3452	55 34 6	3435	56 55 43	3419
	α Pegasi	W.	39 53 59	3999	41 5 40	3941	42 18 18	3890	43 31 48	3842
	Aldebaran	E.	43 52 22	3067	42 23 32	3065	40 54 39	3061	39 25 42	3058
	Pollux	E.	88 4 46	3113	86 36 52	3110	85 8 55	3108	83 40 55	3105
27	Fomalhaut	W.	63 48 7	3348	65 11 23	3335	66 34 54	3323	67 58 39	3312
	α Pegasi	W.	49 50 28	3652	51 8 6	3622	52 26 17	3593	53 44 59	3586
	Aldebaran	E.	31 59 46	3037	30 30 19	3032	29 0 46	3026	27 31 6	3021
	Pollux	E.	76 19 47	3085	74 51 19	3080	73 22 45	3076	71 54 6	3071
	Saturn	E.	90 22 58	3028	88 53 20	3023	87 23 36	3018	85 53 45	3012
28	Fomalhaut	W.	75 0 40	3258	76 25 41	3247	77 50 54	3238	79 16 18	3228
	α Pegasi	W.	60 25 18	3454	61 46 34	3434	63 8 12	3415	64 30 12	3397
	Pollux	E.	64 29 22	3047	63 0 8	3042	61 30 47	3037	60 1 20	3033
	Saturn	E.	78 22 42	2981	76 52 6	2975	75 21 22	2969	73 50 30	2962
29	Fomalhaut	W.	86 26 2	3185	87 52 29	3178	89 19 5	3170	90 45 50	3163
	α Pegasi	W.	71 24 54	3320	72 48 42	3306	74 12 46	3294	75 37 4	3282
	Pollux	E	52 32 41	3009	51 2 40	3005	49 32 34	3002	48 2 24	2999
	Saturn	E.	66 14 0	2926	64 42 14	2919	63 10 19	2912	61 38 15	2904
	Regulus	E.	88 1 10	2935	86 29 35	2927	84 57 50	2920	83 25 56	2912
30	Fomalhaut	W.	98 1 42	3130	99 29 15	3124	100 56 55	3119	102 24 41	3114
	α Pegasi	W.	82 42 6	3226	84 7 44	3216	85 33 34	3207	86 59 35	3198
	α Arietis	W.	39 4 55	3260	40 29 53	3229	41 55 28	3200	43 21 37	3173
	Pollux	E.	40 30 41	2989	39 0 15	2989	37 29 49	2990	35 59 24	2992
	Saturn	E.	53 55 29	2866	52 22 26	2858	50 49 13	2850	49 15 50	2842
	Regulus	E.	75 44 3	2874	74 11 11	2866	72 38 9	2859	71 4 57	2850

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from / Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	16 29 13.77	10.794	S. 21 48 46.5	−23.35	16 16.00	70.30	10 50.62	0.936
Frid.	2	16 33 33.17	10.822	21 57 54.4	22.30	16 16.15	70.38	10 27.84	0.963
Sat.	3	16 37 53.21	10.848	22 6 36.9	21.23	16 16.29	70.46	10 4.43	0.989
SUN.	4	16 42 13.86	10.873	22 14 53.8	−20.16	16 16.42	70.54	9 40.40	1.014
Mon.	5	16 46 35.10	10.897	22 22 44.9	19.08	16 16.55	70.62	9 15.78	1.038
Tues.	6	16 50 56.91	10.920	22 30 9.9	17.99	16 16.67	70.69	8 50.59	1.061
Wed.	7	16 55 19.28	10.942	22 37 8.5	−16.89	16 16.79	70.76	8 24.86	1.083
Thur.	8	16 59 42.17	10.963	22 43 40.6	15.78	16 16.90	70.83	7 58.61	1.104
Frid.	9	17 4 5.54	10.983	22 49 46.0	14.66	16 17.01	70.89	7 31.86	1.124
Sat.	10	17 8 29.36	11.002	22 55 24.3	−13.53	16 17.12	70.95	7 4.65	1.143
SUN.	11	17 12 53.62	11.019	23 0 35.5	12.40	16 17.23	71.00	6 37.03	1.160
Mon.	12	17 17 18.28	11.035	23 5 19.3	11.26	16 17.33	71.05	6 9.01	1.176
Tues.	13	17 21 43.30	11.049	23 9 35.7	−10.11	16 17.43	71.10	5 40.62	1.190
Wed.	14	17 26 8.66	11.062	23 13 24.4	8.96	16 17.52	71.14	5 11.90	1.203
Thur.	15	17 30 34.31	11.073	23 16 45.3	7.80	16 17.61	71.17	4 42.88	1.214
Frid.	16	17 35 0.21	11.083	23 19 38.3	− 6.63	16 17.70	71.20	4 13.62	1.224
Sat.	17	17 39 26.32	11.092	23 22 3.3	5.45	16 17.78	71.23	3 44.15	1.232
SUN.	18	17 43 52.61	11.099	23 24 0.2	4.27	16 17.86	71.25	3 14.49	1.239
Mon.	19	17 48 19.05	11.104	23 25 28.9	− 3.10	16 17.94	71.27	2 44.69	1.244
Tues.	20	17 52 45.59	11.107	23 26 29.2	1.92	16 18.01	71.28	2 14.80	1.247
Wed.	21	17 57 12.19	11.109	23 27 1.3	− 0.74	16 18.08	71.29	1 44.84	1.249
Thur.	22	18 1 38.82	11.110	23 27 5.1	+ 0.44	16 18.14	71.30	1 14.84	1.250
Frid.	23	18 6 5.45	11.109	23 26 40.5	1.62	16 18.20	71.30	0 44.85	1.249
Sat.	24	18 10 32.04	11.107	23 25 47.6	2.80	16 18.25	71.29	0 14.90	1.247
SUN.	25	18 14 58.56	11.103	23 24 26.4	+ 3.98	16 18.30	71.28	0 14.98	1.243
Mon.	26	18 19 24.98	11.098	23 22 36.9	5.15	16 18.34	71.27	0 44.76	1.238
Tues.	27	18 23 51.26	11.092	23 20 19.2	6.32	16 18.37	71.25	1 14.40	1.232
Wed.	28	18 28 17.37	11.084	23 17 33.4	+ 7.49	16 18.39	71.23	1 43.87	1.224
Thur.	29	18 32 43.29	11.076	23 14 19.5	8.66	16 18.41	71.20	2 13.15	1.216
Frid.	30	18 37 8.98	11.066	23 10 37.7	9.82	16 18.43	71.17	2 42.21	1.206
Sat.	31	18 41 34.43	11.055	23 6 28.0	10.99	16 18.44	71.14	3 11.02	1.195
SUN.	32	18 45 59.59	11.043	S. 23 1 50.5	+12.14	16 18.44	71.10	3 39.55	1.182

Note.—The mean time of semidiameter passing may be found by subtracting $0^{s}.19$ from the sidereal time.

The sign − prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to / Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	16 29 15.72	10.792	S. 21 48 50.7	−23.34	10 50.45	0.936	16 40 6.17
Frid.	2	16 33 35.06	10.819	21 57 58.3	22.29	10 27.67	0.963	16 44 2.73
Sat.	3	16 37 55.03	10.845	22 6 40.5	21.22	10 4.26	0.989	16 47 59.29
SUN.	4	16 42 15.61	10.870	22 14 57.1	−20.15	9 40.23	1.014	16 51 55.84
Mon.	5	16 46 36.78	10.894	22 22 47.9	19.07	9 15.62	1.038	16 55 52.40
Tues.	6	16 50 58.52	10.917	22 30 12.6	17.98	8 50.44	1.061	16 59 48.96
Wed.	7	16 55 20.81	10.939	22 37 10.9	−16.88	8 24.71	1.083	17 3 45.52
Thur.	8	16 59 43.61	10.960	22 43 42.7	15.77	7 58.46	1.104	17 7 42.07
Frid.	9	17 4 6.91	10.980	22 49 47.8	14.65	7 31.72	1.124	17 11 38.63
Sat.	10	17 8 30.66	10.999	22 55 25.9	−13.52	7 4.52	1.143	17 15 35.18
SUN.	11	17 12 54.84	11.016	23 0 36.9	12.39	6 36.90	1.160	17 19 31.74
Mon.	12	17 17 19.41	11.032	23 5 20.5	11.25	6 8.89	1.176	17 23 28.30
Tues.	13	17 21 44.35	11.046	23 9 36.7	−10.10	5 40.51	1.190	17 27 24.86
Wed.	14	17 26 9.62	11.059	23 13 25.2	8.95	5 11.79	1.203	17 31 21.41
Thur.	15	17 30 35.18	11.070	23 16 46.0	7.79	4 42.79	1.214	17 35 17.97
Frid.	16	17 35 0.99	11.081	23 19 38.8	− 6.62	4 13.54	1.224	17 39 14.53
Sat.	17	17 39 27.01	11.088	23 22 3.6	5.45	3 44.08	1.232	17 43 11.09
SUN.	18	17 43 53.22	11.095	23 24 0.4	4.27	3 14.42	1.239	17 47 7.64
Mon.	19	17 48 19.56	11.100	23 25 29.0	− 3.10	2 44.64	1.244	17 51 4.20
Tues.	20	17 52 46.00	11.103	23 26 29.3	1.92	2 14.76	1.247	17 55 0.76
Wed.	21	17 57 12.51	11.105	23 27 1.3	− 0.74	1 44.81	1.249	17 58 57.32
Thur.	22	18 1 39.05	11.106	23 27 5.1	+ 0.44	1 14.82	1.250	18 2 53.87
Frid.	23	18 6 5.59	11.105	23 26 40.5	1.62	0 44.84	1.249	18 6 50.43
Sat.	24	18 10 32.09	11.103	23 25 47.6	2.80	0 14.90	1.247	18 10 46.99
SUN.	25	18 14 58.52	11.099	23 24 26.4	+ 3.98	0 14.97	1.243	18 14 43.55
Mon.	26	18 19 24.84	11.094	23 22 37.0	5.15	0 44.74	1.238	18 18 40.10
Tues.	27	18 23 51.03	11.088	23 20 19.4	6.32	1 14.37	1.232	18 22 36.66
Wed.	28	18 28 17.05	11.080	23 17 33.6	+ 7.49	1 43.83	1.224	18 26 33.22
Thur.	29	18 32 42.88	11.072	23 14 19.8	8.66	2 13.10	1.216	18 30 29.78
Frid.	30	18 37 8.48	11.062	23 10 38.1	9.82	2 42.15	1.206	18 34 26.33
Sat.	31	18 41 33.84	11.051	23 6 28.5	10.98	3 10.95	1.195	18 38 22.89
SUN.	32	18 45 58.92	11.039	S. 23 1 51.2	+12.13	3 39.47	1.182	18 42 19.45

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

Diff. for 1 Hour,
+ 9ˢ.8565.
(Table III.)

DECEMBER, 1887.

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	335	249 1 32.9	1 0.6	152.10	+ 0.01	9.9937244	− 27.8	7 18 41.76
2	336	250 2 23.9	1 51.4	152.15	0.11	9.9936591	26.7	7 14 45.85
3	337	251 3 16.1	2 43.4	152.20	0.23	9.9935962	25.7	7 10 49.94
4	338	252 4 9.4	3 36.6	152.25	+ 0.35	9.9935358	− 24.7	7 6 54.03
5	339	253 5 4.0	4 31.0	152.30	0.49	9.9934778	23.7	7 2 58.11
6	340	254 5 59.9	5 26.7	152.35	0.62	9.9934220	22.8	6 59 2.20
7	341	255 6 57.1	6 23.8	152.40	+ 0.74	9.9933684	− 21.9	6 55 6.29
8	342	256 7 55.6	7 22.1	152.45	0.85	9.9933169	21.0	6 51 10.38
9	343	257 8 55.2	8 21.6	152.50	0.93	9.9932673	20.2	6 47 14.48
10	344	258 9 55.9	9 22.1	152.55	+ 0.98	9.9932195	− 19.5	6 43 18.57
11	345	259 10 57.6	10 23.6	152.60	1.01	9.9931735	18.8	6 39 22.66
12	346	260 12 0.4	11 26.3	152.64	1.01	9.9931292	18.1	6 35 26.75
13	347	261 13 4.2	12 30.0	152.68	+ 0.97	9.9930865	− 17.4	6 31 30.83
14	348	262 14 8.8	13 34.4	152.71	0.90	9.9930452	16.8	6 27 34.92
15	349	263 15 14.1	14 39.5	152.74	0.82	9.9930054	16.1	6 23 39.01
16	350	264 16 20.0	15 45.2	152.76	+ 0.71	9.9929672	− 15.5	6 19 43.10
17	351	265 17 26.5	16 51.6	152.78	0.58	9.9929307	14.8	6 15 47.18
18	352	266 18 33.5	17 58.4	152.80	0.44	9.9928959	14.2	6 11 51.27
19	353	267 19 40.8	19 5.5	152.81	+ 0.31	9.9928628	− 13.5	6 7 55.35
20	354	268 20 48.3	20 12.8	152.82	0.18	9.9928315	12.7	6 3 59.44
21	355	269 21 56.0	21 20.3	152.83	+ 0.07	9.9928021	11.8	6 0 3.54
22	356	270 23 3.8	22 28.0	152.83	− 0.04	9.9927748	− 10.9	5 56 7.63
23	357	271 24 11.8	23 35.8	152.83	0.12	9.9927497	10.0	5 52 11.72
24	358	272 25 19.9	24 43.7	152.84	0.16	9.9927269	9.0	5 48 15.81
25	359	273 26 28.0	25 51.6	152.84	− 0.18	9.9927066	− 7.9	5 44 19.89
26	360	274 27 36.1	26 59.5	152.84	0.17	9.9926890	6.8	5 40 23.98
27	361	275 28 44.3	28 7.6	152.84	0.13	9.9926742	5.7	5 36 28.06
28	362	276 29 52.6	29 15.8	152.85	− 0.06	9.9926621	− 4.5	5 32 32.15
29	363	277 31 0.9	30 23.9	152.85	+ 0.03	9.9926528	3.3	5 28 36.24
30	364	278 32 9.2	31 32.0	152.85	0.14	9.9926464	2.1	5 24 40.32
31	365	279 33 17.7	32 40.3	152.86	0.26	9.9926428	− 0.9	5 20 44.41
32	366	280 34 26.4	33 48.9	152.87	+ 0.39	9.9926421	+ 0.3	5 16 48.50

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0ᵈ.0.

Diff. for 1 Hour,
— 9ˢ.8296.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 6.9	15 10.5	55 21.6	+1.06	55 34.6	+1.10	12 59.1	2.13	16.2
2	15 14.1	15 17.9	55 48.0	1.14	56 1.9	1.18	13 50.8	2.18	17.2
3	15 21.8	15 25.9	56 16.3	1.22	56 31.1	1.25	14 43.6	2.20	18.2
4	15 30.0	15 34.2	56 46.3	+1.28	57 1.9	+1.31	15 36.5	2.20	19.2
5	15 38.6	15 43.0	57 17.8	1.34	57 34.1	1.37	16 29.1	2.17	20.2
6	15 47.5	15 52.1	57 50.6	1.38	58 7.3	1.40	17 20.9	2.14	21.2
7	15 56.6	16 1.2	58 24.1	+1.40	58 40.8	+1.38	18 12.1	2.12	22.2
8	16 5.6	16 9.9	58 57.1	1.33	59 12.7	1.26	19 3.1	2.13	23.2
9	16 13.9	16 17.5	59 27.4	1.17	59 40.8	1.05	19 54.7	2.17	24.2
10	16 20.7	16 23.3	59 52.5	+0.89	60 2.1	+0.70	20 47.5	2.24	25.2
11	16 25.2	16 26.4	60 9.2	+0.47	60 13.4	+0.22	21 42.3	2.33	26.2
12	16 26.7	16 26.1	60 14.5	−0.05	60 12.2	−0.34	22 39.1	2.41	27.2
13	16 24.5	16 21.9	60 6.4	−0.63	59 57.1	−0.92	23 37.6	2.46	28.2
14	16 18.5	16 14.2	59 44.4	1.19	59 28.6	1.42	☌		29.2
15	16 9.1	16 3.4	59 10.0	1.65	58 49.0	1.83	0 36.7	2.45	0.7
16	15 57.2	15 50.6	58 26.2	−1.96	58 2.0	−2.05	1 34.8	2.38	1.7
17	15 43.8	15 37.0	57 37.1	2.09	57 11.9	2.09	2 30.5	2.26	2.7
18	15 30.2	15 23.6	56 47.0	2.05	56 22.8	1.96	3 23.1	2.10	3.7
19	15 17.4	15 11.6	55 59.9	−1.84	55 38.6	−1.70	4 12.2	1.98	4.7
20	15 6.3	15 1.5	55 19.1	1.53	55 1.8	1.35	4 58.2	1.86	5.7
21	14 57.5	14 54.1	54 46.8	1.15	54 34.3	0.93	5 41.9	1.78	6.7
22	14 51.4	14 49.4	54 24.4	−0.72	54 17.1	−0.50	6 24.2	1.74	7.7
23	14 48.1	14 47.5	54 12.4	−0.28	54 10.4	−0.06	7 5.8	1.73	8.7
24	14 47.7	14 48.5	54 10.9	+0.14	54 13.8	+0.34	7 47.7	1.76	9.7
25	14 49.9	14 51.9	54 19.1	+0.53	54 26.5	+0.70	8 30.6	1.82	10.7
26	14 54.5	14 57.5	54 35.8	0.85	54 46.9	0.99	9 15.4	1.91	11.7
27	15 0.9	15 4.7	54 59.5	1.10	55 13.3	1.20	10 2.4	2.01	12.7
28	15 8.7	15 13.0	55 28.2	+1.27	55 43.8	+1.32	10 51.9	2.12	13.7
29	15 17.3	15 21.8	55 59.8	1.35	56 16.1	1.36	11 43.8	2.20	14.7
30	15 26.2	15 30.6	56 32.4	1.35	56 48.5	1.32	12 37.2	2.25	15.7
31	15 34.8	15 39.0	57 4.1	1.28	57 19.2	1.23	13 31.4	2.26	16.7
32	15 42.9	15 46.6	57 33.6	+1.17	57 47.2	+1.10	14 25.3	2.23	17.7

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	5 12 50.33	2.1766	N.18 58 16.4	4.192
1	5 15 1.02	2.1797	19 2 25.1	4.099
2	5 17 11.89	2.1827	19 6 28.3	4.006
3	5 19 22.95	2.1858	19 10 25.9	3.912
4	5 21 34.19	2.1888	19 14 17.8	3.817
5	5 23 45.61	2.1919	19 18 4.0	3.722
6	5 25 57.22	2.1949	19 21 44.5	3.627
7	5 28 9.00	2.1978	19 25 19.3	3.532
8	5 30 20.96	2.2007	19 28 48.3	3.434
9	5 32 33.09	2.2036	19 32 11.4	3.336
10	5 34 45.39	2.2064	19 35 28.6	3.237
11	5 36 57.86	2.2093	19 38 39.9	3.139
12	5 39 10.51	2.2121	19 41 45.3	3.041
13	5 41 23.32	2.2148	19 44 44.8	2.942
14	5 43 36.29	2.2176	19 47 38.3	2.841
15	5 45 49.43	2.2202	19 50 25.7	2.740
16	5 48 2.72	2.2228	19 53 7.1	2.639
17	5 50 16.17	2.2254	19 55 42.4	2.538
18	5 52 29.77	2.2280	19 58 11.6	2.436
19	5 54 43.53	2.2305	20 0 34.7	2.333
20	5 56 57.43	2.2329	20 2 51.6	2.230
21	5 59 11.48	2.2353	20 5 2.3	2.127
22	6 1 25.67	2.2377	20 7 6.8	2.022
23	6 3 40.00	2.2401	N.20 9 5.0	1.917

FRIDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	6 5 54.48	2.2424	N.20 10 56.9	1.812
1	6 8 9.09	2.2446	20 12 42.5	1.707
2	6 10 23.83	2.2468	20 14 21.8	1.602
3	6 12 38.71	2.2490	20 15 54.8	1.497
4	6 14 53.71	2.2511	20 17 21.4	1.390
5	6 17 8.84	2.2532	20 18 41.6	1.282
6	6 19 24.09	2.2552	20 19 55.3	1.175
7	6 21 39.46	2.2571	20 21 2.6	1.068
8	6 23 54.94	2.2590	20 22 3.5	0.961
9	6 26 10.54	2.2609	20 22 57.9	0.853
10	6 28 26.25	2.2627	20 23 45.8	0.744
11	6 30 42.07	2.2645	20 24 27.2	0.635
12	6 32 57.99	2.2662	20 25 2.0	0.526
13	6 35 14.01	2.2678	20 25 30.3	0.417
14	6 37 30.13	2.2695	20 25 52.0	0.307
15	6 39 46.35	2.2711	20 26 7.1	0.197
16	6 42 2.66	2.2726	20 26 15.7	+0.087
17	6 44 19.06	2.2740	20 26 17.6	−0.023
18	6 46 35.54	2.2754	20 26 12.9	0.133
19	6 48 52.11	2.2767	20 26 1.6	0.244
20	6 51 8.75	2.2780	20 25 43.6	0.355
21	6 53 25.47	2.2793	20 25 19.0	0.466
22	6 55 42.27	2.2806	20 24 47.7	0.577
23	6 57 59.14	2.2817	20 24 9.7	0.689
24	7 0 16.07	2.2827	N.20 23 25.0	0.801

SATURDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	7 0 16.07	2.2827	N.20 23 25.0	0.801
1	7 2 33.07	2.2838	20 22 33.6	0.912
2	7 4 50.13	2.2848	20 21 35.5	1.023
3	7 7 7.25	2.2857	20 20 30.8	1.135
4	7 9 24.42	2.2866	20 19 19.3	1.247
5	7 11 41.64	2.2875	20 18 1.1	1.359
6	7 13 58.92	2.2883	20 16 36.2	1.471
7	7 16 16.24	2.2890	20 15 4.6	1.583
8	7 18 33.60	2.2897	20 13 26.3	1.695
9	7 20 51.00	2.2903	20 11 41.2	1.807
10	7 23 8.44	2.2909	20 9 49.4	1.919
11	7 25 25.91	2.2914	20 7 50.9	2.032
12	7 27 43.41	2.2919	20 5 45.6	2.144
13	7 30 0.94	2.2923	20 3 33.6	2.256
14	7 32 18.49	2.2927	20 1 14.9	2.367
15	7 34 36.06	2.2930	19 58 49.5	2.479
16	7 36 53.65	2.2933	19 56 17.4	2.591
17	7 39 11.26	2.2936	19 53 38.6	2.702
18	7 41 28.88	2.2938	19 50 53.1	2.814
19	7 43 46.51	2.2939	19 48 0.9	2.926
20	7 46 4.15	2.2940	19 45 2.0	3.037
21	7 48 21.79	2.2940	19 41 56.4	3.148
22	7 50 39.43	2.2940	19 38 44.2	3.259
23	7 52 57.07	2.2940	N.19 35 25.3	3.370

SUNDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 55 14.71	2.2939	N.19 31 59.8	3.480
1	7 57 32.34	2.2938	19 28 27.7	3.591
2	7 59 49.96	2.2936	19 24 48.9	3.702
3	8 2 7.57	2.2933	19 21 3.5	3.812
4	8 4 25.16	2.2931	19 17 11.5	3.922
5	8 6 42.74	2.2928	19 13 12.9	4.031
6	8 9 0.30	2.2924	19 9 7.8	4.140
7	8 11 17.83	2.2920	19 4 56.1	4.249
8	8 13 35.34	2.2917	19 0 37.9	4.357
9	8 15 52.83	2.2912	18 56 13.2	4.466
10	8 18 10.29	2.2907	18 51 42.0	4.574
11	8 20 27.72	2.2902	18 47 4.3	4.682
12	8 22 45.11	2.2896	18 42 20.1	4.790
13	8 25 2.47	2.2890	18 37 29.5	4.897
14	8 27 19.79	2.2883	18 32 32.5	5.003
15	8 29 37.07	2.2877	18 27 29.1	5.109
16	8 31 54.31	2.2870	18 22 19.4	5.215
17	8 34 11.51	2.2862	18 17 3.3	5.321
18	8 36 28.66	2.2854	18 11 40.9	5.426
19	8 38 45.76	2.2847	18 6 12.2	5.531
20	8 41 2.82	2.2839	18 0 37.2	5.636
21	8 43 19.83	2.2831	17 54 55.9	5.740
22	8 45 36.79	2.2822	17 49 8.4	5.843
23	8 47 53.69	2.2812	17 43 14.8	5.945
24	8 50 10.54	2.2803	N.17 37 15.0	6.048

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 50 10.54	2.2803	N.17 37 15.0	6.048
1	8 52 27.33	2.2793	17 31 9.0	6.150
2	8 54 44.06	2.2784	17 24 57.0	6.251
3	8 57 0.74	2.2775	17 18 38.9	6.352
4	8 59 17.36	2.2764	17 12 14.7	6.453
5	9 1 33.91	2.2753	17 5 44.5	6.553
6	9 3 50.40	2.2743	16 59 8.4	6.652
7	9 6 6.83	2.2732	16 52 26.3	6.751
8	9 8 23.19	2.2722	16 45 38.3	6.849
9	9 10 39.49	2.2711	16 38 44.4	6.947
10	9 12 55.72	2.2699	16 31 44.6	7.045
11	9 15 11.88	2.2688	16 24 39.0	7.141
12	9 17 27.98	2.2677	16 17 27.7	7.237
13	9 19 44.01	2.2666	16 10 10.6	7.332
14	9 21 59.97	2.2654	16 2 47.8	7.427
15	9 24 15.86	2.2643	15 55 19.3	7.522
16	9 26 31.68	2.2631	15 47 45.2	7.615
17	9 28 47.43	2.2619	15 40 5.5	7.707
18	9 31 3.10	2.2607	15 32 20.3	7.799
19	9 33 18.71	2.2596	15 24 29.6	7.891
20	9 35 34.25	2.2583	15 16 33.4	7.982
21	9 37 49.71	2.2571	15 8 31.7	8.073
22	9 40 5.10	2.2559	15 0 24.6	8.162
23	9 42 20.42	2.2547	N.14 52 12.2	8.251

TUESDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 44 35.67	2.2536	N.14 43 54.5	8.339
1	9 46 50.85	2.2524	14 35 31.5	8.427
2	9 49 5.96	2.2512	14 27 3.3	8.514
3	9 51 21.00	2.2500	14 18 29.9	8.600
4	9 53 35.96	2.2487	14 9 51.3	8.685
5	9 55 50.85	2.2476	14 1 7.7	8.769
6	9 58 5.67	2.2464	13 52 19.0	8.853
7	10 0 20.42	2.2453	13 43 25.3	8.936
8	10 2 35.11	2.2442	13 34 26.7	9.019
9	10 4 49.73	2.2431	13 25 23.1	9.101
10	10 7 4.28	2.2419	13 16 14.6	9.182
11	10 9 18.76	2.2408	13 7 1.3	9.261
12	10 11 33.18	2.2397	12 57 43.3	9.339
13	10 13 47.53	2.2387	12 48 20.6	9.418
14	10 16 1.82	2.2376	12 38 53.2	9.496
15	10 18 16.04	2.2365	12 29 21.1	9.573
16	10 20 30.20	2.2355	12 19 44.4	9.649
17	10 22 44.30	2.2344	12 10 3.2	9.724
18	10 24 58.33	2.2334	12 0 17.5	9.798
19	10 27 12.31	2.2325	11 50 27.4	9.872
20	10 29 26.23	2.2315	11 40 32.9	9.944
21	10 31 40.09	2.2306	11 30 34.1	10.016
22	10 33 53.90	2.2297	11 20 31.0	10.087
23	10 36 7.65	2.2288	11 10 23.7	10.157
24	10 38 21.35	2.2279	N.11 0 12.1	10.227

WEDNESDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 38 21.35	2.2279	N.11 0 12.1	10.227
1	10 40 35.00	2.2271	10 49 56.4	10.295
2	10 42 48.60	2.2262	10 39 36.7	10.362
3	10 45 2.15	2.2255	10 29 13.0	10.428
4	10 47 15.66	2.2247	10 18 45.3	10.494
5	10 49 29.12	2.2240	10 8 13.7	10.558
6	10 51 42.54	2.2233	9 57 38.3	10.622
7	10 53 55.91	2.2226	9 46 59.1	10.685
8	10 56 9.25	2.2220	9 36 16.1	10.747
9	10 58 22.55	2.2214	9 25 29.4	10.808
10	11 0 35.82	2.2208	9 14 39.1	10.868
11	11 2 49.05	2.2202	9 3 45.2	10.927
12	11 5 2.25	2.2197	8 52 47.8	10.986
13	11 7 15.42	2.2192	8 41 46.9	11.043
14	11 9 28.56	2.2188	8 30 42.6	11.099
15	11 11 41.68	2.2185	8 19 35.0	11.154
16	11 13 54.78	2.2181	8 8 24.1	11.208
17	11 16 7.85	2.2177	7 57 10.0	11.262
18	11 18 20.90	2.2174	7 45 52.7	11.314
19	11 20 33.94	2.2172	7 34 32.3	11.365
20	11 22 46.96	2.2169	7 23 8.9	11.415
21	11 24 59.97	2.2168	7 11 42.5	11.465
22	11 27 12.97	2.2167	7 0 13.1	11.514
23	11 29 25.97	2.2166	N. 6 48 40.8	11.562

THURSDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 31 38.96	2.2165	N. 6 37 5.7	11.608
1	11 33 51.95	2.2165	6 25 27.9	11.653
2	11 36 4.94	2.2165	6 13 47.4	11.697
3	11 38 17.93	2.2166	6 2 4.3	11.739
4	11 40 30.93	2.2167	5 50 18.7	11.781
5	11 42 43.94	2.2168	5 38 30.5	11.823
6	11 44 56.95	2.2171	5 26 39.9	11.863
7	11 47 9.98	2.2173	5 14 47.0	11.902
8	11 49 23.03	2.2176	5 2 51.7	11.940
9	11 51 36.09	2.2179	4 50 54.2	11.977
10	11 53 49.18	2.2183	4 38 54.5	12.012
11	11 56 2.29	2.2187	4 26 52.7	12.047
12	11 58 15.42	2.2191	4 14 48.9	12.080
13	12 0 28.58	2.2196	4 2 43.1	12.112
14	12 2 41.78	2.2202	3 50 35.4	12 143
15	12 4 55.01	2.2208	3 38 25.9	12.173
16	12 7 8.28	2.2215	3 26 14.6	12.202
17	12 9 21.59	2.2223	3 14 1.6	12.231
18	12 11 34.95	2.2231	3 1 46.9	12.258
19	12 13 48.36	2.2238	2 49 30.7	12.283
20	12 16 1.81	2.2246	2 37 13.0	12.306
21	12 18 15.31	2.2255	2 24 53.9	12.329
22	12 20 28.87	2.2265	2 12 33.5	12.352
23	12 22 42.49	2.2274	2 0 11.7	12.373
24	12 24 56.16	2.2284	N. 1 47 48.7	12.392

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 9.					**SUNDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 24 56.16	2.2284	N. 1 47 48.7	12.392	0	14 13 59.40	2.3318	S. 8 5 29.7	11.813
1	12 27 9.90	2.2296	1 35 24.6	12.411	1	14 16 19.40	2.3349	8 17 17.1	11.767
2	12 29 23.71	2.2307	1 22 59.4	12.429	2	14 18 39.59	2.3380	8 29 1.7	11.718
3	12 31 37.58	2.2318	1 10 33.2	12.444	3	14 20 59.96	2.3411	8 40 43.3	11.668
4	12 33 51.53	2.2331	0 58 6.1	12.459	4	14 23 20.52	2.3443	8 52 21.9	11.618
5	12 36 5.56	2.2344	0 45 38.1	12.473	5	14 25 41.28	2.3475	9 3 57.5	11.567
6	12 38 19.66	2.2357	0 33 9.4	12.484	6	14 28 2.22	2.3506	9 15 30.0	11.515
7	12 40 33.84	2.2371	0 20 40.0	12.495	7	14 30 23.35	2.3538	9 26 59.3	11.460
8	12 42 48.11	2.2386	N. 0 8 9.9	12.506	8	14 32 44.67	2.3570	9 38 25.2	11.402
9	12 45 2.47	2.2401	S. 0 4 20.8	12.515	9	14 35 6.19	2.3602	9 49 47.6	11.344
10	12 47 16.92	2.2416	0 16 51.9	12.522	10	14 37 27.90	2.3635	10 1 6.5	11.286
11	12 49 31.46	2.2431	0 29 23.4	12.528	11	14 39 49.81	2.3668	10 12 21.9	11.226
12	12 51 46.09	2.2447	0 41 55.2	12.533	12	14 42 11.92	2.3701	10 23 33.6	11.163
13	12 54 0.82	2.2463	0 54 27.3	12.537	13	14 44 34.22	2.3734	10 34 41.5	11.100
14	12 56 15.65	2.2481	1 6 59.6	12.538	14	14 46 56.72	2.3767	10 45 45.6	11.036
15	12 58 30.59	2.2499	1 19 31.9	12.539	15	14 49 19.42	2.3800	10 56 45.8	10.969
16	13 0 45.63	2.2517	1 32 4.3	12.539	16	14 51 42.32	2.3833	11 7 41.9	10.901
17	13 3 0.79	2.2536	1 44 36.6	12.538	17	14 54 5.42	2.3866	11 18 33.9	10.832
18	13 5 16.06	2.2554	1 57 8.8	12.535	18	14 56 28.71	2.3899	11 29 21.7	10.761
19	13 7 31.44	2.2573	2 9 40.8	12.531	19	14 58 52.20	2.3932	11 40 5.2	10.689
20	13 9 46.94	2.2593	2 22 12.5	12.525	20	15 1 15.90	2.3967	11 50 44.4	10.616
21	13 12 2.56	2.2614	2 34 43.8	12.518	21	15 3 39.80	2.4000	12 1 19.1	10.541
22	13 14 18.31	2.2635	2 47 14.7	12.510	22	15 6 3.90	2.4032	12 11 49.3	10.465
23	13 16 34.18	2.2656	S. 2 59 45.0	12.500	23	15 8 28.19	2.4065	S. 12 22 14.9	10.387
	SATURDAY 10.					**MONDAY 12.**			
0	13 18 50.18	2.2678	S. 3 12 14.7	12.489	0	15 10 52.68	2.4098	S. 12 32 35.7	10.307
1	13 21 6.32	2.2701	3 24 43.7	12.477	1	15 13 17.37	2.4132	12 42 51.7	10.227
2	13 23 22.59	2.2722	3 37 12.0	12.464	2	15 15 42.26	2.4165	12 53 2.9	10.146
3	13 25 38.99	2.2745	3 49 39.4	12.449	3	15 18 7.35	2.4197	13 3 9.2	10.062
4	13 27 55.53	2.2769	4 2 5.9	12.432	4	15 20 32.63	2.4230	13 13 10.4	9.977
5	13 30 12.22	2.2793	4 14 31.3	12.414	5	15 22 58.11	2.4262	13 23 6.5	9.891
6	13 32 29.05	2.2817	4 26 55.6	12.395	6	15 25 23.78	2.4294	13 32 57.3	9.803
7	13 34 46.03	2.2842	4 39 18.7	12.375	7	15 27 49.64	2.4327	13 42 42.8	9.714
8	13 37 3.16	2.2867	4 51 40.6	12.354	8	15 30 15.70	2.4359	13 52 23.0	9.625
9	13 39 20.44	2.2893	5 4 1.2	12.331	9	15 32 41.95	2.4391	14 1 57.8	9.533
10	13 41 37.88	2.2919	5 16 20.3	12.306	10	15 35 8.39	2.4422	14 11 27.0	9.440
11	13 43 55.47	2.2945	5 28 37.9	12.280	11	15 37 35.02	2.4453	14 20 50.6	9.347
12	13 46 13.22	2.2972	5 40 53.9	12.252	12	15 40 1.83	2.4484	14 30 8.6	9.252
13	13 48 31.13	2.2999	5 53 8.2	12.223	13	15 42 28.83	2.4515	14 39 20.8	9.155
14	13 50 49.21	2.3027	6 5 20.7	12.193	14	15 44 56.01	2.4546	14 48 27.2	9.057
15	13 53 7.45	2.3054	6 17 31.4	12.162	15	15 47 23.38	2.4577	14 57 27.6	8.957
16	13 55 25.86	2.3082	6 29 40.1	12.128	16	15 49 50.93	2.4606	15 6 22.0	8.857
17	13 57 44.44	2.3111	6 41 46.8	12.094	17	15 52 18.65	2.4634	15 15 10.4	8.756
18	14 0 3.19	2.3140	6 53 51.4	12.058	18	15 54 46.54	2.4663	15 23 52.7	8.653
19	14 2 22.12	2.3169	7 5 53.8	12.021	19	15 57 14.61	2.4692	15 32 28.8	8.549
20	14 4 41.22	2.3198	7 17 53.9	11.982	20	15 59 42.85	2.4721	15 40 58.6	8.443
21	14 7 0.49	2.3227	7 29 51.6	11.942	21	16 2 11.26	2.4748	15 49 22.0	8.337
22	14 9 19.94	2.3257	7 41 46.9	11.900	22	16 4 39.83	2.4775	15 57 39.0	8.229
23	14 11 39.58	2.3288	7 53 39.6	11.857	23	16 7 8.56	2.4802	16 5 49.5	8.120
24	14 13 59.40	2.3318	S. 8 5 29.7	11.813	24	16 9 37.46	2.4829	S. 16 13 53.4	8.010

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 9 37.46	2.4829	S.16 13 53.4	8.010
1	16 12 6.51	2.4854	16 21 50.7	7.900
2	16 14 35.71	2.4879	16 29 41.4	7.788
3	16 17 5.06	2.4904	16 37 25.3	7.675
4	16 19 34.56	2.4929	16 45 2.4	7.561
5	16 22 4.21	2.4953	16 52 32.6	7.445
6	16 24 34.00	2.4976	16 59 55.8	7.329
7	16 27 3.92	2.4998	17 7 12.1	7.212
8	16 29 33.97	2.5019	17 14 21.3	7.094
9	16 32 4.15	2.5041	17 21 23.4	6.975
10	16 34 34.46	2.5061	17 28 18.3	6.855
11	16 37 4.88	2.5080	17 35 6.0	6.734
12	16 39 35.42	2.5099	17 41 46.4	6.612
13	16 42 6.07	2.5118	17 48 19.4	6.489
14	16 44 36.83	2.5136	17 54 45.1	6.366
15	16 47 7.70	2.5152	18 1 3.4	6.242
16	16 49 38.66	2.5168	18 7 14.2	6.117
17	16 52 9.72	2.5184	18 13 17.4	5.991
18	16 54 40.87	2.5198	18 19 13.1	5.865
19	16 57 12.10	2.5212	18 25 1.2	5.737
20	16 59 43.41	2.5225	18 30 41.6	5.608
21	17 2 14.80	2.5237	18 36 14.2	5.479
22	17 4 46.26	2.5248	18 41 39.1	5.351
23	17 7 17.78	2.5258	S.18 46 56.3	5.222

WEDNESDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 9 49.36	2.5268	S.18 52 5.7	5.092
1	17 12 21.00	2.5277	18 57 7.3	4.960
2	17 14 52.68	2.5284	19 2 0.9	4.827
3	17 17 24.40	2.5290	19 6 46.6	4.695
4	17 19 56.16	2.5297	19 11 24.3	4.562
5	17 22 27.96	2.5303	19 15 54.1	4.430
6	17 24 59.79	2.5307	19 20 15.9	4.297
7	17 27 31.64	2.5309	19 24 29.7	4.163
8	17 30 3.50	2.5311	19 28 35.4	4.028
9	17 32 35.37	2.5312	19 32 33.0	3.893
10	17 35 7.24	2.5312	19 36 22.6	3.758
11	17 37 39.12	2.5312	19 40 4.0	3.623
12	17 40 10.99	2.5310	19 43 37.3	3.488
13	17 42 42.84	2.5307	19 47 2.5	3.352
14	17 45 14.68	2.5304	19 50 19.5	3.215
15	17 47 46.49	2.5299	19 53 28.3	3.079
16	17 50 18.27	2.5294	19 56 29.0	2.943
17	17 52 50.02	2.5287	19 59 21.5	2.807
18	17 55 21.72	2.5279	20 2 5.8	2.671
19	17 57 53.37	2.5271	20 4 42.0	2.534
20	18 0 24.97	2.5262	20 7 9.9	2.397
21	18 2 56.51	2.5251	20 9 29.6	2.260
22	18 5 27.98	2.5239	20 11 41.1	2.123
23	18 7 59.38	2.5226	20 13 44.4	1.987
24	18 10 30.69	2.5212	S.20 15 39.5	1.850

THURSDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 10 30.69	2.5212	S.20 15 39.5	1.850
1	18 13 1.92	2.5198	20 17 26.4	1.713
2	18 15 33.07	2.5183	20 19 5.1	1.577
3	18 18 4.12	2.5166	20 20 35.7	1.441
4	18 20 35.06	2.5148	20 21 58.1	1.305
5	18 23 5.90	2.5130	20 23 12.3	1.169
6	18 25 36.62	2.5110	20 24 18.4	1.034
7	18 28 7.22	2.5090	20 25 16.4	0.898
8	18 30 37.70	2.5068	20 26 6.2	0.762
9	18 33 8.04	2.5046	20 26 47.9	0.627
10	18 35 38.25	2.5023	20 27 21.5	0.493
11	18 38 8.32	2.4998	20 27 47.1	0.359
12	18 40 38.23	2.4973	20 28 4.6	0.225
13	18 43 7.99	2.4947	20 28 14.1	−0.092
14	18 45 37.59	2.4920	20 28 15.6	+0.041
15	18 48 7.03	2.4892	20 28 9.2	0.174
16	18 50 36.29	2.4863	20 27 54.8	0.306
17	18 53 5.38	2.4833	20 27 32.5	0.437
18	18 55 34.29	2.4802	20 27 2.3	0.568
19	18 58 3.01	2.4771	20 26 24.3	0.698
20	19 0 31.54	2.4738	20 25 38.5	0.828
21	19 2 59.87	2.4705	20 24 44.9	0.958
22	19 5 28.00	2.4671	20 23 43.5	1.087
23	19 7 55.92	2.4636	S.20 22 34.4	1.216

FRIDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 10 23.63	2.4600	S.20 21 17.6	1.343
1	19 12 51.12	2.4563	20 19 53.2	1.470
2	19 15 18.39	2.4526	20 18 21.2	1.596
3	19 17 45.44	2.4489	20 16 41.7	1.721
4	19 20 12.26	2.4450	20 14 54.7	1.846
5	19 22 38.84	2.4410	20 13 0.2	1.971
6	19 25 5.18	2.4370	20 10 58.2	2.095
7	19 27 31.28	2.4329	20 8 48.8	2.217
8	19 29 57.13	2.4287	20 6 32.1	2.338
9	19 32 22.73	2.4245	20 4 8.2	2.459
10	19 34 48.07	2.4203	20 1 37.0	2.580
11	19 37 13.16	2.4160	19 58 58.6	2.699
12	19 39 37.99	2.4116	19 56 13.1	2.817
13	19 42 2.55	2.4071	19 53 20.5	2.935
14	19 44 26.84	2.4025	19 50 20.9	3.052
15	19 46 50.85	2.3979	19 47 14.2	3.169
16	19 49 14.59	2.3932	19 44 0.6	3.284
17	19 51 38.04	2.3885	19 40 40.1	3.398
18	19 54 1.21	2.3837	19 37 12.8	3.512
19	19 56 24.09	2.3790	19 33 38.7	3.624
20	19 58 46.69	2.3742	19 29 57.9	3.735
21	20 1 9.00	2.3693	19 26 10.5	3.845
22	20 3 31.01	2.3644	19 22 16.5	3.955
23	20 5 52.73	2.3595	19 18 15.9	4.064
24	20 8 14.15	2.3544	S.19 14 8.8	4.172

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 8 14.15	2.3544	S. 19 14 8.8	4.172
1	20 10 35.26	2.3493	19 9 55.3	4.278
2	20 12 56.07	2.3443	19 5 35.5	4.384
3	20 15 16.58	2.3392	19 1 9.3	4.489
4	20 17 36.78	2.3341	18 56 36.8	4.593
5	20 19 56.67	2.3289	18 51 58.1	4.696
6	20 22 16.24	2.3236	18 47 13.3	4.797
7	20 24 35.50	2.3184	18 42 22.5	4.897
8	20 26 54.45	2.3131	18 37 25.6	4.997
9	20 29 13.08	2.3078	18 32 22.8	5.096
10	20 31 31.39	2.3025	18 27 14.1	5.193
11	20 33 49.38	2.2972	18 21 59.6	5.290
12	20 36 7.06	2.2919	18 16 39.3	5.386
13	20 38 24.41	2.2865	18 11 13.3	5.481
14	20 40 41.44	2.2812	18 5 41.6	5.574
15	20 42 58.15	2.2758	18 0 4.4	5.666
16	20 45 14.53	2.2703	17 54 21.7	5.757
17	20 47 30.59	2.2649	17 48 33.5	5.848
18	20 49 46.32	2.2595	17 42 39.9	5.937
19	20 52 1.73	2.2541	17 36 41.0	6.026
20	20 54 16.81	2.2487	17 30 36.8	6.113
21	20 56 31.57	2.2432	17 24 27.4	6.199
22	20 58 46.00	2.2377	17 18 12.9	6.285
23	21 1 0.10	2.2323	S. 17 11 53.2	6.370

SUNDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	21 3 13.88	2.2269	S. 17 5 28.5	6.452
1	21 5 27.33	2.2215	16 58 58.9	6.534
2	21 7 40.46	2.2161	16 52 24.4	6.616
3	21 9 53.26	2.2106	16 45 45.0	6.696
4	21 12 5.73	2.2052	16 39 0.9	6.774
5	21 14 17.88	2.1998	16 32 12.1	6.852
6	21 16 29.71	2.1944	16 25 18.6	6.930
7	21 18 41.21	2.1890	16 18 20.5	7.006
8	21 20 52.39	2.1837	16 11 17.9	7.080
9	21 23 3.25	2.1783	16 4 10.9	7.154
10	21 25 13.78	2.1729	15 56 59.5	7.227
11	21 27 23.99	2.1676	15 49 43.7	7.299
12	21 29 33.89	2.1623	15 42 23.6	7.369
13	21 31 43.47	2.1570	15 34 59.3	7.439
14	21 33 52.73	2.1517	15 27 30.9	7.508
15	21 36 1.68	2.1465	15 19 58.3	7.577
16	21 38 10.31	2.1412	15 12 21.7	7.643
17	21 40 18.63	2.1361	15 4 41.1	7.709
18	21 42 26.64	2.1309	14 56 56.6	7.774
19	21 44 34.34	2.1258	14 49 8.2	7.838
20	21 46 41.73	2.1207	14 41 16.0	7.901
21	21 48 48.82	2.1156	14 33 20.1	7.963
22	21 50 55.60	2.1105	14 25 20.5	8.024
23	21 53 2.08	2.1055	14 17 17.2	8.084
24	21 55 8.26	2.1005	S. 14 9 10.4	8.143

MONDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 55 8.26	2.1005	S. 14 9 10.4	8.143
1	21 57 14.14	2.0955	14 1 0.1	8.201
2	21 59 19.72	2.0906	13 52 46.3	8.259
3	22 1 25.01	2.0857	13 44 29.0	8.316
4	22 3 30.00	2.0808	13 36 8.4	8.371
5	22 5 34.70	2.0760	13 27 44.5	8.425
6	22 7 39.12	2.0712	13 19 17.4	8.478
7	22 9 43.25	2.0664	13 10 47.1	8.531
8	22 11 47.09	2.0617	13 2 13.6	8.583
9	22 13 50.65	2.0570	12 53 37.1	8.633
10	22 15 53.93	2.0524	12 44 57.6	8.683
11	22 17 56.94	2.0478	12 36 15.1	8.733
12	22 19 59.67	2.0432	12 27 29.6	8.782
13	22 22 2.13	2.0387	12 18 41.2	8.829
14	22 24 4.32	2.0342	12 9 50.1	8.875
15	22 26 6.24	2.0298	12 0 56.2	8.921
16	22 28 7.90	2.0255	11 51 59.6	8.966
17	22 30 9.30	2.0212	11 43 0.3	9.010
18	22 32 10.44	2.0169	11 33 58.4	9.053
19	22 34 11.32	2.0126	11 24 53.9	9.096
20	22 36 11.95	2.0084	11 15 46.9	9.137
21	22 38 12.33	2.0043	11 6 37.5	9.178
22	22 40 12.46	2.0002	10 57 25.6	9.218
23	22 42 12.35	1.9961	S. 10 48 11.3	9.257

TUESDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 44 11.99	1.9920	S. 10 38 54.7	9.296
1	22 46 11.39	1.9881	10 29 35.8	9.333
2	22 48 10.56	1.9842	10 20 14.7	9.369
3	22 50 9.50	1.9804	10 10 51.5	9.405
4	22 52 8.21	1.9766	10 1 26.1	9.441
5	22 54 6.69	1.9728	9 51 58.6	9.475
6	22 56 4.94	1.9690	9 42 29.1	9.509
7	22 58 2.97	1.9654	9 32 57.6	9.542
8	23 0 0.79	1.9619	9 23 24.1	9.574
9	23 1 58.40	1.9584	9 13 48.7	9.606
10	23 3 55.80	1.9548	9 4 11.4	9.637
11	23 5 52.98	1.9513	8 54 32.3	9.666
12	23 7 49.95	1.9479	8 44 51.5	9.694
13	23 9 46.72	1.9446	8 35 9.0	9.723
14	23 11 43.30	1.9413	8 25 24.7	9.752
15	23 13 39.68	1.9381	8 15 38.7	9.780
16	23 15 35.87	1.9349	8 5 51.1	9.806
17	23 17 31.87	1.9318	7 56 2.0	9.831
18	23 19 27.69	1.9287	7 46 11.4	9.856
19	23 21 23.32	1.9257	7 36 19.3	9.880
20	23 23 18.77	1.9227	7 26 25.8	9.904
21	23 25 14.05	1.9199	7 16 30.8	9.927
22	23 27 9.16	1.9171	7 6 34.5	9.949
23	23 29 4.10	1.9143	6 56 36.9	9.971
24	23 30 58.87	1.9115	S. 6 46 38.0	9.992

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 21.					**FRIDAY 23.**				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 30 58.87	1.9115	S. 6 46 38.0	9.992	0	1 0 40.09	1.8475	N. 1 25 44.2	10.305
1	23 32 53.48	1.9088	6 36 37.8	10.013	1	1 2 30.94	1.8476	1 36 2.3	10.297
2	23 34 47.93	1.9062	6 26 36.4	10.032	2	1 4 21.80	1.8477	1 46 19.9	10.289
3	23 36 42.22	1.9036	6 16 33.9	10.051	3	1 6 12.66	1.8478	1 56 37.0	10.281
4	23 38 36.36	1.9012	6 6 30.3	10.069	4	1 8 3.54	1.8481	2 6 53.6	10.272
5	23 40 30.36	1.8987	5 56 25.6	10.087	5	1 9 54.44	1.8484	2 17 9.7	10.263
6	23 42 24.21	1.8963	5 46 19.8	10.105	6	1 11 45.35	1.8487	2 27 25.2	10.253
7	23 44 17.92	1.8940	5 36 12.0	10.122	7	1 13 36.28	1.8491	2 37 40.1	10.243
8	23 46 11.49	1.8917	5 26 5.2	10.138	8	1 15 27.24	1.8496	2 47 54.4	10.232
9	23 48 4.92	1.8894	5 15 56.5	10.153	9	1 17 18.23	1.8501	2 58 8.0	10.221
10	23 49 58.22	1.8672	5 5 46.9	10.168	10	1 19 9.25	1.8507	3 8 20.9	10.209
11	23 51 51.39	1.8852	4 55 36.4	10.183	11	1 21 0.31	1.8512	3 18 33.0	10.196
12	23 53 44.44	1.8832	4 45 25.0	10.196	12	1 22 51.40	1.8519	3 28 44.4	10.183
13	23 55 37.37	1.8812	4 35 12.9	10.209	13	1 24 42.54	1.8527	3 38 55.0	10.169
14	23 57 30.18	1.8792	4 25 0.0	10.221	14	1 26 33.72	1.8534	3 49 4.7	10.155
15	23 59 22.87	1.8772	4 14 46.4	10.232	15	1 28 24.95	1.8542	3 59 13.6	10.141
16	0 1 15.45	1.8754	4 4 32.1	10.243	16	1 30 16.23	1.8551	4 9 21.6	10.126
17	0 3 7.92	1.8737	3 54 17.2	10.254	17	1 32 7.57	1.8561	4 19 28.7	10.110
18	0 5 0.29	1.8720	3 44 1.6	10.264	18	1 33 58.96	1.8570	4 29 34.8	10.094
19	0 6 52.56	1.8703	3 33 45.5	10.273	19	1 35 50.41	1.8581	4 39 39.9	10.077
20	0 8 44.73	1.8687	3 23 28.8	10.282	20	1 37 41.93	1.8592	4 49 44.0	10.059
21	0 10 36.81	1.8672	3 13 11.6	10.291	21	1 39 33.52	1.8604	4 59 47.0	10.041
22	0 12 28.80	1.8657	3 2 53.9	10.298	22	1 41 25.18	1.8616	5 9 48.9	10.022
23	0 14 20.70	1.8643	S. 2 52 35.8	10.305	23	1 43 16.91	1.8629	N. 5 19 49.7	10.003
THURSDAY 22.					**SATURDAY 24.**				
0	0 16 12.52	1.8630	S. 2 42 17.3	10.312	0	1 45 8.72	1.8642	N. 5 29 49.3	9.983
1	0 18 4.26	1.8617	2 31 58.4	10.318	1	1 47 0.61	1.8655	5 39 47.7	9.963
2	0 19 55.92	1.8604	2 21 39.2	10.323	2	1 48 52.58	1.8669	5 49 44.9	9.942
3	0 21 47.51	1.8592	2 11 19.6	10.328	3	1 50 44.64	1.8684	5 59 40.8	9.921
4	0 23 39.03	1.8581	2 0 59.8	10.333	4	1 52 36.79	1.8699	6 9 35.4	9.899
5	0 25 30.48	1.8570	1 50 39.7	10.337	5	1 54 29.03	1.8714	6 19 28.7	9.877
6	0 27 21.87	1.8560	1 40 19.4	10.340	6	1 56 21.36	1.8730	6 29 20.6	9.854
7	0 29 13.20	1.8551	1 29 58.9	10.342	7	1 58 13.79	1.8747	6 39 11.1	9.830
8	0 31 4.48	1.8542	1 19 38.3	10.344	8	2 0 6.33	1.8765	6 49 0.2	9.806
9	0 32 55.70	1.8533	1 9 17.6	10.346	9	2 1 58.97	1.8783	6 58 47.8	9.781
10	0 34 46.87	1.8525	0 58 56.8	10.347	10	2 3 51.72	1.8801	7 8 33.9	9.755
11	0 36 38.00	1.8518	0 48 36.0	10.347	11	2 5 44.58	1.8819	7 18 18.4	9.729
12	0 38 29.09	1.8512	0 38 15.1	10.347	12	2 7 37.55	1.8838	7 28 1.4	9.703
13	0 40 20.14	1.8505	0 27 54.3	10.347	13	2 9 30.64	1.8858	7 37 42.8	9.676
14	0 42 11.15	1.8499	0 17 33.5	10.346	14	2 11 23.85	1.8878	7 47 22.5	9.648
15	0 44 2.13	1.8494	S. 0 7 12.8	10.344	15	2 13 17.18	1.8899	7 57 0.5	9.619
16	0 45 53.08	1.8490	N. 0 3 7.8	10.341	16	2 15 10.64	1.8920	8 6 36.8	9.590
17	0 47 44.01	1.8487	0 13 28.2	10.338	17	2 17 4.22	1.8941	8 16 11.3	9.560
18	0 49 34.92	1.8483	0 23 48.4	10.335	18	2 18 57.93	1.8963	8 25 44.0	9.530
19	0 51 25.81	1.8480	0 34 8.4	10.332	19	2 20 51.78	1.8986	8 35 14.9	9.499
20	0 53 16.68	1.8478	0 44 28.2	10.327	20	2 22 45.76	1.9009	8 44 43.9	9.467
21	0 55 7.54	1.8476	0 54 47.7	10.322	21	2 24 39.88	1.9032	8 54 11.0	9.435
22	0 56 58.39	1.8475	1 5 6.9	10.317	22	2 26 34.14	1.9056	9 3 36.1	9.402
23	0 58 49.24	1.8475	1 15 25.7	10.311	23	2 28 28.55	1.9081	9 12 59.2	9.369
24	1 0 40.09	1.8475	N. 1 25 44.2	10.305	24	2 30 23.11	1.9106	N. 9 22 20.4	9.336

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 30 23.11	1.9106	N. 9 22 20.4	9.336
1	2 32 17.82	1.9131	9 31 39.5	9.301
2	2 34 12.68	1.9156	9 40 56.5	9.265
3	2 36 7.69	1.9182	9 50 11.3	9.229
4	2 38 2.86	1.9208	9 59 24.0	9.192
5	2 39 58.19	1.9235	10 8 34.4	9.155
6	2 41 53.68	1.9263	10 17 42.6	9.117
7	2 43 49.34	1.9291	10 26 48.5	9.078
8	2 45 45.17	1.9319	10 35 52.0	9.039
9	2 47 41.17	1.9347	10 44 53.2	8.999
10	2 49 37.34	1.9376	10 53 51.9	8.958
11	2 51 33.68	1.9405	11 2 48.2	8.917
12	2 53 30.20	1.9435	11 11 42.0	8.875
13	2 55 26.90	1.9465	11 20 33.2	8.833
14	2 57 23.78	1.9496	11 29 21.9	8.790
15	2 59 20.85	1.9527	11 38 8.0	8.746
16	3 1 18.11	1.9558	11 46 51.4	8.701
17	3 3 15.55	1.9589	11 55 32.1	8.655
18	3 5 13.18	1.9621	12 4 10.0	8.608
19	3 7 11.01	1.9654	12 12 45.1	8.562
20	3 9 9.03	1.9686	12 21 17.4	8.515
21	3 11 7.24	1.9719	12 29 46.9	8.467
22	3 13 5.65	1.9753	12 38 13.5	8.418
23	3 15 4.27	1.9787	N.12 46 37.1	8.368

MONDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	3 17 3.09	1.9820	N.12 54 57.7	8.317
1	3 19 2.11	1.9854	13 3 15.2	8.266
2	3 21 1.34	1.9889	13 11 29.6	8.214
3	3 23 0.78	1.9924	13 19 40.9	8.162
4	3 25 0.43	1.9959	13 27 49.1	8.110
5	3 27 0.29	1.9994	13 35 54.1	8.056
6	3 29 0.36	2.0030	13 43 55.8	8.001
7	3 31 0.65	2.0066	13 51 54.2	7.945
8	3 33 1.16	2.0102	13 59 49.2	7.888
9	3 35 1.88	2.0138	14 7 40.8	7.832
10	3 37 2.82	2.0175	14 15 29.0	7.774
11	3 39 3.98	2.0212	14 23 13.7	7.715
12	3 41 5.37	2.0250	14 30 54.8	7.656
13	3 43 6.98	2.0287	14 38 32.4	7.597
14	3 45 8.82	2.0325	14 46 6.4	7.536
15	3 47 10.88	2.0363	14 53 36.7	7.474
16	3 49 13.17	2.0401	15 1 3.3	7.412
17	3 51 15.69	2.0438	15 8 26.1	7.349
18	3 53 18.43	2.0476	15 15 45.1	7.285
19	3 55 21.40	2.0515	15 23 0.3	7.221
20	3 57 24.61	2.0555	15 30 11.6	7.155
21	3 59 28.06	2.0594	15 37 18.9	7.088
22	4 1 31.74	2.0633	15 44 22.2	7.021
23	4 3 35.65	2.0671	15 51 21.5	6.954
24	4 5 39.79	2.0710	N.15 58 16.7	6.886

TUESDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 5 39.79	2.0710	N.15 58 16.7	6.886
1	4 7 44.17	2.0750	16 5 7.8	6.817
2	4 9 48.79	2.0789	16 11 54.7	6.747
3	4 11 53.64	2.0828	16 18 37.4	6.676
4	4 13 58.73	2.0868	16 25 15.8	6.604
5	4 16 4.06	2.0908	16 31 49.9	6.532
6	4 18 9.63	2.0948	16 38 19.6	6.458
7	4 20 15.44	2.0987	16 44 44.9	6.384
8	4 22 21.48	2.1027	16 51 5.7	6.310
9	4 24 27.77	2.1068	16 57 22.1	6.235
10	4 26 34.30	2.1108	17 3 33.9	6.159
11	4 28 41.06	2.1147	17 9 41.1	6.082
12	4 30 48.06	2.1187	17 15 43.7	6.004
13	4 32 55.30	2.1227	17 21 41.6	5.925
14	4 35 2.78	2.1267	17 27 34.7	5.845
15	4 37 10.50	2.1307	17 33 23.0	5.765
16	4 39 18.46	2.1347	17 39 6.5	5.684
17	4 41 26.66	2.1386	17 44 45.1	5.602
18	4 43 35.09	2.1425	17 50 18.8	5.520
19	4 45 43.76	2.1465	17 55 47.5	5.437
20	4 47 52.67	2.1504	18 1 11.2	5.352
21	4 50 1.81	2.1543	18 6 29.8	5.267
22	4 52 11.19	2.1582	18 11 43.3	5.182
23	4 54 20.80	2.1621	N.18 16 51.7	5.097

WEDNESDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	4 56 30.64	2.1660	N.18 21 54.9	5.010
1	4 58 40.72	2.1699	18 26 52.9	4.922
2	5 0 51.03	2.1737	18 31 45.5	4.833
3	5 3 1.57	2.1776	18 36 32.8	4.743
4	5 5 12.34	2.1814	18 41 14.7	4.653
5	5 7 23.34	2.1852	18 45 51.2	4.562
6	5 9 34.57	2.1890	18 50 22.2	4.471
7	5 11 46.02	2.1927	18 54 47.7	4.379
8	5 13 57.70	2.1965	18 59 7.6	4.286
9	5 16 9.60	2.2002	19 3 22.0	4.192
10	5 18 21.73	2.2039	19 7 30.7	4.097
11	5 20 34.07	2.2075	19 11 33.7	4.002
12	5 22 46.63	2.2111	19 15 31.0	3.907
13	5 24 59.40	2.2147	19 19 22.5	3.810
14	5 27 12.39	2.2183	19 23 8.2	3.713
15	5 29 25.60	2.2219	19 26 48.1	3.616
16	5 31 39.02	2.2254	19 30 22.1	3.517
17	5 33 52.64	2.2288	19 33 50.2	3.418
18	5 36 6.47	2.2322	19 37 12.3	3.318
19	5 38 20.50	2.2355	19 40 28.4	3.217
20	5 40 34.73	2.2389	19 43 38.4	3.117
21	5 42 49.17	2.2422	19 46 42.4	3.016
22	5 45 3.80	2.2455	19 49 40.3	2.913
23	5 47 18.63	2.2487	19 52 32.0	2.810
24	5 49 33.65	2.2519	N.19 55 17.5	2.707

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	h m s	s	° ′ ″	″
0	5 49 33.65	2.2519	N.19 55 17.5	2.707
1	5 51 48.86	2.2551	19 57 56.8	2.602
2	5 54 4.26	2.2582	20 0 29.8	2.497
3	5 56 19.84	2.2612	20 2 56.5	2.392
4	5 58 35.60	2.2642	20 5 16.9	2.287
5	6 0 51.54	2.2672	20 7 30.9	2.180
6	6 3 7.66	2.2701	20 9 38.5	2.073
7	6 5 23.95	2.2729	20 11 39.7	1.966
8	6 7 40.41	2.2757	20 13 34.4	1.858
9	6 9 57.04	2.2785	20 15 22.7	1.750
10	6 12 13.83	2.2812	20 17 4.4	1.641
11	6 14 30.78	2.2838	20 18 39.6	1.532
12	6 16 47.89	2.2865	20 20 8.2	1.422
13	6 19 5.16	2.2891	20 21 30.2	1.312
14	6 21 22.58	2.2915	20 22 45.6	1.201
15	6 23 40.14	2.2939	20 23 54.3	1.089
16	6 25 57.85	2.2963	20 24 56.3	0.978
17	6 28 15.70	2.2986	20 25 51.6	0.866
18	6 30 33.68	2.3008	20 26 40.2	0.753
19	6 32 51.80	2.3031	20 27 22.0	0.641
20	6 35 10.05	2.3052	20 27 57.1	0.528
21	6 37 28.43	2.3073	20 28 25.4	0.414
22	6 39 46.93	2.3093	20 28 46.8	0.300
23	6 42 5.55	2.3112	N.20 29 1.4	0.187

FRIDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
0	6 44 24.28	2.3132	N.20 29 9.2	+0.073
1	6 46 43.13	2.3150	20 29 10.1	−0.042
2	6 49 2.08	2.3167	20 29 4.1	0.157
3	6 51 21.14	2.3185	20 28 51.2	0.272
4	6 53 40.30	2.3202	20 28 31.4	0.387
5	6 55 59.56	2.3217	20 28 4.7	0.503
6	6 58 18.91	2.3232	20 27 31.0	0.619
7	7 0 38.35	2.3247	20 26 50.4	0.735
8	7 2 57.87	2.3261	20 26 2.8	0.852
9	7 5 17.48	2.3274	20 25 8.2	0.968
10	7 7 37.16	2.3287	20 24 6.6	1.085
11	7 9 56.92	2.3299	20 22 58.0	1.201
12	7 12 16.75	2.3310	20 21 42.5	1.317
13	7 14 36.64	2.3320	20 20 20.0	1.434
14	7 16 56.59	2.3331	20 18 50.4	1.551
15	7 19 16.61	2.3341	20 17 13.8	1.668
16	7 21 36.68	2.3349	20 15 30.2	1.785
17	7 23 56.80	2.3357	20 13 39.6	1.903
18	7 26 16.96	2.3364	20 11 41.9	2.020
19	7 28 37.17	2.3371	20 9 37.2	2.136
20	7 30 57.41	2.3377	20 7 25.6	2.253
21	7 33 17.69	2.3382	20 5 6.9	2.370
22	7 35 38.00	2.3387	20 2 41.2	2.487
23	7 37 58.33	2.3391	20 0 8.5	2.604
24	7 40 18.69	2.3395	N.19 57 28.7	2.721

SATURDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	7 40 18.69	2.3395	N.19 57 28.7	2.721
1	7 42 39.07	2.3397	19 54 42.0	2.837
2	7 44 59.46	2.3399	19 51 48.3	2.953
3	7 47 19.86	2.3401	19 48 47.6	3.070
4	7 49 40.27	2.3402	19 45 39.9	3.186
5	7 52 0.69	2.3403	19 42 25.3	3.302
6	7 54 21.11	2.3402	19 39 3.7	3.417
7	7 56 41.52	2.3401	19 35 35.2	3.532
8	7 59 1.92	2.3399	19 31 59.8	3.648
9	8 1 22.31	2.3398	19 28 17.4	3.763
10	8 3 42.69	2.3396	19 24 28.2	3.878
11	8 6 3.06	2.3393	19 20 32.1	3.993
12	8 8 23.41	2.3389	19 16 29.1	4.107
13	8 10 43.73	2.3384	19 12 19.3	4.220
14	8 13 4.02	2.3379	19 8 2.7	4.334
15	8 15 24.28	2.3373	19 3 39.2	4.447
16	8 17 44.50	2.3368	18 59 9.0	4.560
17	8 20 4.69	2.3362	18 54 32.0	4.672
18	8 22 24.84	2.3354	18 49 48.3	4.784
19	8 24 44.94	2.3347	18 44 57.9	4.896
20	8 27 5.00	2.3339	18 40 0.8	5.007
21	8 29 25.01	2.3330	18 34 57.0	5.118
22	8 31 44.96	2.3321	18 29 46.6	5.228
23	8 34 4.86	2.3312	N.18 24 29.6	5.339

SUNDAY, JANUARY 1, 1888.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	8 36 24.70	2.3302	N.18 19 5.9	5.449

PHASES OF THE MOON.

		d	h	m
☾ Last Quarter . .	Dec.	7	15	10.7
● New Moon		14	7	21.3
☽ First Quarter . . .		21	19	1.2
○ Full Moon		29	20	14.2

		d	h
☾ Perigee. . . .	Dec.	11	22.0
☾ Apogee.		23	15.7

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	α Arietis	W.	44° 48′ 19″	3148	46° 15′ 31″	3124	47° 43′ 11″	3103	49° 11′ 17″	3082
	Pollux	E.	34 29 1	2996	32 58 43	3002	31 28 33	3010	29 58 33	3020
	Saturn	E.	47 42 17	2834	46 8 33	2826	44 34 39	2818	43 0 35	2810
	Regulus	E.	69 31 34	2842	67 58 1	2835	66 24 18	2827	64 50 25	2819
2	α Arietis	W.	56 37 46	2993	58 8 7	2977	59 38 48	2962	61 9 48	2949
	Aldebaran	W.	23 12 0	2782	24 46 52	2772	26 21 56	2764	27 57 11	2755
	Saturn	E.	35 7 37	2769	33 32 29	2762	31 57 11	2753	30 21 42	2746
	Regulus	E.	56 58 23	2779	55 23 27	2770	53 48 20	2763	52 13 3	2754
	Mars	E.	86 40 48	2966	85 9 53	2958	83 38 47	2950	82 7 31	2941
	Venus	E.	111 57 15	3148	110 30 3	3138	109 2 40	3129	107 35 6	3121
3	α Arietis	W.	68 49 3	2884	70 21 42	2873	71 54 36	2861	73 27 45	2849
	Aldebaran	W.	35 56 16	2713	37 32 38	2704	39 9 12	2696	40 45 57	2687
	Regulus	E.	44 13 54	2713	42 37 31	2704	41 0 57	2696	39 24 12	2688
	Mars	E.	74 28 25	2897	72 56 2	2888	71 23 28	2880	69 50 43	2871
	Spica	E.	98 3 35	2743	96 27 52	2735	94 51 58	2725	93 15 52	2717
	Venus	E.	100 14 39	3078	98 46 2	3069	97 17 14	3059	95 48 14	3050
4	α Arietis	W.	81 17 1	2798	82 51 32	2788	84 26 16	2778	86 1 13	2768
	Aldebaran	W.	48 52 37	2644	50 30 32	2635	52 8 39	2626	53 46 58	2618
	Regulus	E.	31 17 39	2646	29 39 46	2638	28 1 42	2629	26 23 26	2621
	Mars	E.	62 4 7	2826	60 30 13	2817	58 56 7	2808	57 21 49	2798
	Spica	E.	85 12 34	2675	83 35 20	2666	81 57 55	2657	80 20 18	2649
	Venus	E.	88 20 30	3005	86 50 23	2996	85 20 5	2986	83 49 35	2977
	Sun	E.	135 1 47	3022	133 32 1	3010	132 2 1	3000	130 31 48	2989
5	Aldebaran	W.	62 1 38	2572	63 41 12	2563	65 20 58	2553	67 0 57	2544
	Mars	E.	49 27 18	2752	47 51 47	2742	46 16 3	2733	44 40 7	2723
	Spica	E.	72 9 19	2606	70 30 32	2598	68 51 34	2589	67 12 24	2581
	Venus	E.	76 14 10	2930	74 42 29	2920	73 10 35	2910	71 38 29	2900
	Jupiter	E.	102 1 6	2653	100 23 23	2644	98 45 28	2635	97 7 20	2625
	Sun	E.	122 57 20	2935	121 25 46	2925	119 53 59	2914	118 21 58	2904
6	Aldebaran	W.	75 24 10	2496	77 5 29	2486	78 47 2	2476	80 28 49	2467
	Pollux	W.	32 10 54	2657	33 48 32	2632	35 26 43	2611	37 5 23	2591
	Saturn	W.	17 14 25	2489	18 55 54	2479	20 37 37	2468	22 19 35	2458
	Mars	E.	36 37 15	2676	35 0 3	2666	33 22 38	2656	31 44 59	2646
	Spica	E.	58 53 41	2539	57 13 22	2530	55 32 51	2523	53 52 10	2515
	Venus	E.	63 54 48	2850	62 21 25	2840	60 47 49	2829	59 13 59	2819
	Jupiter	E.	88 53 22	2576	87 13 54	2566	85 34 12	2556	83 54 16	2546
	Sun	E.	110 38 29	2849	109 5 5	2838	107 31 27	2828	105 57 35	2817
7	Aldebaran	W.	89 1 12	2417	90 44 23	2406	92 27 49	2396	94 11 29	2386
	Pollux	W.	45 25 5	2506	47 6 10	2491	48 47 36	2476	50 29 23	2462
	Saturn	W.	30 53 3	2406	32 36 29	2396	34 20 10	2386	36 4 5	2375
	Spica	E.	45 26 8	2480	43 44 27	2474	42 2 37	2468	40 20 39	2464
	Venus	E.	51 21 31	2767	49 46 20	2757	48 10 56	2747	46 35 18	2737
	Jupiter	E.	75 31 10	2495	73 49 50	2485	72 8 16	2475	70 26 28	2466
	Sun	E.	98 4 41	2762	96 29 23	2750	94 53 50	2740	93 18 3	2729
8	Pollux	W.	59 3 4	2398	60 46 42	2386	62 30 37	2373	64 14 50	2362

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	α Arietis	W.	50° 39′ 49″	3062	52° 8′ 45″	3043	53° 38′ 4″	3026	55° 7′ 45″	3009
	Pollux	E.	28 28 45	3034	26 59 14	3051	25 30 4	3073	24 1 21	3102
	Saturn	E.	41 26 20	2802	39 51 55	2795	38 17 20	2786	36 42 34	2778
	Regulus	E.	63 16 22	2811	61 42 8	2803	60 7 44	2795	58 33 9	2786
2	α Arietis	W.	62 41 5	2935	64 12 40	2922	65 44 31	2909	67 16 39	2896
	Aldebaran	W.	29 32 38	2747	31 8 16	2738	32 44 5	2730	34 20 5	2722
	Saturn	E.	28 46 3	2738	27 10 13	2729	25 34 12	2721	23 58 0	2713
	Regulus	E.	50 37 35	2746	49 1 56	2738	47 26 6	2730	45 50 6	2721
	Mars	E.	80 36 4	2932	79 4 26	2924	77 32 37	2915	76 0 37	2905
	Venus	E.	106 7 22	3112	104 39 27	3104	103 11 22	3095	101 43 6	3086
3	α Arietis	W.	75 1 9	2838	76 34 47	2828	78 8 38	2818	79 42 43	2808
	Aldebaran	W.	42 22 54	2680	44 0 2	2670	45 37 22	2661	47 14 54	2653
	Regulus	E.	37 47 16	2680	36 10 9	2671	34 32 50	2663	32 55 20	2655
	Mars	E.	68 17 47	2862	66 44 39	2853	65 11 20	2844	63 37 49	2835
	Spica	E.	91 39 35	2709	90 3 7	2700	88 26 27	2692	86 49 36	2684
	Venus	E.	94 19 3	3042	92 49 42	3033	91 20 10	3023	89 50 26	3014
4	α Arietis	W.	87 36 23	2759	89 11 45	2750	90 47 19	2741	92 23 4	2733
	Aldebaran	W.	55 25 29	2608	57 4 13	2599	58 43 9	2591	60 22 17	2581
	Regulus	E.	24 44 59	2612	23 6 21	2604	21 27 31	2595	19 48 29	2587
	Mars	E.	55 47 19	2789	54 12 37	2780	52 37 43	2771	51 2 37	2761
	Spica	E.	78 42 29	2640	77 4 29	2632	75 26 17	2624	73 47 54	2615
	Venus	E.	82 18 54	2968	80 48 1	2958	79 16 56	2949	77 45 39	2939
	Sun	E.	129 1 21	2978	127 30 41	2967	125 59 47	2957	124 28 40	2946
5	Aldebaran	W.	68 41 9	2535	70 21 34	2525	72 2 13	2515	73 43 5	2506
	Mars	E.	43 3 58	2713	41 27 36	2704	39 51 2	2695	38 14 15	2685
	Spica	E.	65 33 3	2572	63 53 30	2564	62 13 45	2556	60 33 49	2547
	Venus	E.	70 6 10	2891	68 33 39	2880	67 0 55	2870	65 27 58	2860
	Jupiter	E.	95 28 59	2615	93 50 25	2605	92 11 37	2596	90 32 36	2586
	Sun	E.	116 49 44	2894	115 17 17	2882	113 44 35	2871	112 11 39	2860
6	Aldebaran	W.	82 10 49	2457	83 53 3	2446	85 35 32	2436	87 18 15	2426
	Pollux	W.	38 44 30	2572	40 24 3	2555	42 4 0	2538	43 44 21	2521
	Saturn	W.	24 1 47	2448	25 44 14	2437	27 26 56	2427	29 9 52	2417
	Mars	E.	30 7 7	2638	28 29 3	2629	26 50 47	2619	25 12 18	2610
	Spica	E.	52 11 18	2508	50 30 16	2500	48 49 3	2493	47 7 40	2487
	Venus	E.	57 39 56	2809	56 5 40	2799	54 31 11	2788	52 56 28	2778
	Jupiter	E.	82 14 7	2536	80 33 44	2526	78 53 7	2516	77 12 16	2505
	Sun	E.	104 23 29	2806	102 49 9	2795	101 14 34	2784	99 39 45	2772
7	Aldebaran	W.	95 55 24	2376	97 39 33	2366	99 23 57	2355	101 8 36	2346
	Pollux	W.	52 11 30	2448	53 53 56	2436	55 36 40	2422	57 19 43	2410
	Saturn	W.	37 48 15	2365	39 32 40	2355	41 17 19	2345	43 2 13	2335
	Spica	E.	38 38 35	2460	36 56 25	2457	35 14 11	2455	33 31 55	2456
	Venus	E.	44 59 27	2726	43 23 22	2716	41 47 4	2706	40 10 32	2696
	Jupiter	E.	68 44 27	2456	67 2 12	2445	65 19 42	2436	63 36 58	2426
	Sun	E.	91 42 1	2718	90 5 45	2707	88 29 14	2695	86 52 28	2685
8	Pollux	W.	65 59 20	2350	67 44 6	2340	69 29 7	2329	71 14 24	2319

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
8	Saturn	W.	44 47 22	2324	46 32 46	2315	48 18 24	2304	50 4 17	2295
	Regulus	W.	22 45 57	2339	24 30 59	2329	26 16 16	2319	28 1 48	2309
	Venus	E.	38 33 47	2686	36 56 48	2676	35 19 36	2667	33 42 12	2658
	Jupiter	E.	61 54 0	2416	60 10 48	2407	58 27 23	2397	56 43 44	2387
	Sun	E.	85 15 28	2674	83 38 13	2663	82 0 44	2653	80 23 1	2642
9	Pollux	W.	72 59 56	2309	74 45 43	2299	76 31 44	2289	78 18 0	2280
	Saturn	W.	58 57 16	2247	60 44 34	2238	62 32 5	2229	64 19 49	2220
	Regulus	W.	36 53 8	2260	38 40 6	2251	40 27 17	2242	42 14 42	2233
	Jupiter	E.	48 2 13	2344	46 17 18	2336	44 32 11	2328	42 46 53	2322
	Sun	E.	72 10 53	2592	70 31 47	2582	68 52 27	2573	67 12 55	2564
10	Saturn	W.	73 21 37	2181	75 10 33	2174	76 59 40	2167	78 48 58	2161
	Regulus	W.	51 14 55	2194	53 3 32	2186	54 52 20	2180	56 41 18	2173
	Jupiter	E.	33 58 3	2294	32 11 54	2290	30 25 40	2289	28 39 24	2288
	Sun	E.	58 52 17	2523	57 11 36	2516	55 30 45	2510	53 49 45	2503
11	Saturn	W.	87 57 41	2134	89 47 48	2130	91 38 1	2126	93 28 20	2123
	Regulus	W.	65 48 24	2147	67 38 12	2143	69 28 6	2139	71 18 5	2136
	Sun	E.	45 22 47	2480	43 41 5	2477	41 59 19	2474	40 17 29	2472
12	Saturn	W.	102 40 51	2115	104 31 27	2115	106 22 3	2116	108 12 38	2116
	Regulus	W.	80 28 55	2128	82 19 11	2128	84 9 27	2129	85 59 42	2130
	Sun	E.	31 48 7	2477	30 6 21	2480	28 24 40	2486	26 43 7	2493
16	Sun	W.	22 18 20	2791	23 53 0	2801	25 27 27	2811	27 1 40	2824
	Fomalhaut	E.	50 27 5	2840	48 53 29	2880	47 20 44	2922	45 48 53	2968
	α Pegasi	E.	66 10 46	2829	64 36 56	2858	63 3 43	2887	61 31 8	2919
17	Sun	W.	34 48 25	2897	36 20 48	2913	37 52 50	2930	39 24 31	2946
	α Pegasi	E.	53 58 51	3103	52 30 45	3147	51 3 32	3193	49 37 14	3242
	α Arietis	E.	95 45 41	2680	94 8 34	2696	92 31 49	2713	90 55 26	2729
18	Sun	W.	46 57 36	3032	48 27 9	3050	49 56 20	3067	51 25 10	3084
	α Arietis	E.	82 59 10	2817	81 25 4	2835	79 51 22	2853	78 18 3	2871
	Aldebaran	E.	114 48 48	2661	113 11 16	2678	111 34 7	2695	109 57 21	2712
19	Sun	W.	58 44 11	3168	60 10 59	3183	61 37 28	3198	63 3 39	3214
	α Arietis	E.	70 37 21	2965	69 6 24	2983	67 35 50	3002	66 5 40	3021
	Aldebaran	E.	101 58 50	2790	100 24 9	2805	98 49 48	2821	97 15 47	2835
20	Sun	W.	70 10 5	3287	71 34 32	3300	72 58 44	3313	74 22 40	3325
	α Aquilæ	W.	48 28 54	3984	49 40 49	3948	50 53 20	3917	52 6 23	3887
	α Arietis	E.	58 40 43	3118	57 12 55	3138	55 45 32	3159	54 18 34	3179
	Aldebaran	E.	89 30 14	2903	87 57 59	2915	86 25 59	2927	84 54 14	2939
21	Sun	W.	81 18 57	3381	82 41 35	3391	84 4 2	3400	85 26 19	3408
	α Aquilæ	W.	58 18 7	3782	59 33 28	3767	60 49 5	3752	62 4 57	3740
	α Arietis	E.	47 10 2	3291	45 45 40	3316	44 21 47	3342	42 58 24	3369
	Aldebaran	E.	77 19 0	2990	75 48 35	2999	74 18 21	3008	72 48 18	3016
22	Sun	W.	92 15 27	3445	93 36 53	3450	94 58 13	3454	96 19 28	3459

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
8	SATURN	W.	51° 50′ 24″	2285	53° 36′ 46″	2275	55° 23′ 22″	2266	57° 10′ 12″	2256
	Regulus	W.	29 47 35	2299	31 33 36	2289	33 19 52	2279	35 6 23	2260
	VENUS	E.	32 4 36	2649	30 26 48	2640	28 48 48	2632	27 10 36	2624
	JUPITER	E.	54 59 51	2378	53 15 45	2370	51 31 27	2361	49 46 56	2353
	SUN	E.	78 45 3	2632	77 6 51	2621	75 28 25	2612	73 49 46	2601
9	Pollux	W.	80 4 29	2271	81 51 11	2262	83 38 6	2254	85 25 13	2246
	SATURN	W.	66 7 46	2212	67 55 56	2204	69 44 18	2196	71 32 52	2188
	Regulus	W.	44 2 20	2225	45 50 11	2216	47 38 14	2208	49 26 29	2201
	JUPITER	E.	41 1 25	2315	39 15 47	2309	37 30 0	2303	35 44 5	2298
	SUN	E.	65 33 11	2556	63 53 15	2547	62 13 7	2538	60 32 47	2531
10	SATURN	W.	80 38 25	2155	82 28 1	2149	84 17 46	2143	86 7 40	2138
	Regulus	W.	58 30 26	2167	60 19 43	2161	62 9 9	2156	63 58 43	2151
	JUPITER	E.	26 53 7	2288	25 6 50	2291	23 20 37	2296	21 34 32	2306
	SUN	E.	52 8 36	2497	50 27 19	2492	48 45 55	2487	47 4 24	2483
11	SATURN	W.	95 18 44	2120	97 9 12	2118	98 59 43	2117	100 50 16	2116
	Regulus	W.	73 8 9	2134	74 58 17	2132	76 48 28	2130	78 38 41	2130
	SUN	E.	38 35 37	2472	36 53 44	2471	35 11 50	2472	33 29 57	2474
12	SATURN	W.	110 3 12	2118	111 53 44	2120	113 44 12	2124	115 34 35	2128
	Regulus	W.	87 49 55	2132	89 40 6	2134	91 30 13	2137	93 20 16	2140
	SUN	E.	25 1 44	2502	23 20 33	2512	21 39 37	2526	19 59 0	2543
16	SUN	W.	28 35 37	2837	30 9 17	2851	31 42 39	2866	33 15 42	2881
	Fomalhaut	E.	44 18 0	3017	42 48 8	3070	41 19 22	3129	39 51 47	3192
	α Pegasi	E.	59 59 13	2952	58 28 0	2987	56 57 31	3023	55 27 47	3062
17	SUN	W.	40 55 51	2968	42 26 50	2981	43 57 27	2998	45 27 42	3015
	α Pegasi	E.	48 11 54	3294	46 47 36	3351	45 24 23	3411	44 2 19	3475
	α Arietis	E.	89 19 25	2747	87 43 47	2764	86 8 32	2781	84 33 39	2799
18	SUN	W.	52 53 39	3101	54 21 47	3118	55 49 35	3134	57 17 3	3151
	α Arietis	E.	76 45 7	2890	75 12 35	2909	73 40 27	2927	72 8 42	2946
	Aldebaran	E.	108 20 57	2728	106 44 54	2744	105 9 12	2760	103 33 51	2775
19	SUN	W.	64 29 31	3230	65 55 5	3244	67 20 22	3259	68 45 22	3273
	α Arietis	E.	64 35 53	3040	63 6 30	3060	61 37 31	3078	60 8 55	3098
	Aldebaran	E.	95 42 5	2849	94 8 41	2863	92 35 35	2876	91 2 46	2890
20	SUN	W.	75 46 22	3338	77 9 50	3349	78 33 5	3360	79 56 7	3371
	α Aquilæ	W.	53 19 56	3861	54 33 55	3838	55 48 18	3817	57 3 3	3798
	α Arietis	E.	52 52 0	3200	51 25 51	3222	50 0 8	3245	48 34 52	3267
	Aldebaran	E.	83 22 44	2950	81 51 28	2961	80 20 26	2971	78 49 37	2981
21	SUN	W.	86 48 26	3416	88 10 24	3424	89 32 13	3431	90 53 54	3438
	α Aquilæ	W.	63 21 2	3729	64 37 18	3719	65 53 45	3709	67 10 23	3700
	α Arietis	E.	41 35 32	3398	40 13 13	3430	38 51 30	3463	37 30 25	3499
	Aldebaran	E.	71 18 25	3024	69 48 42	3030	68 19 7	3037	66 49 40	3043
22	SUN	W.	97 40 38	3463	99 1 43	3467	100 22 44	3470	101 43 42	3471

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}.	P. L. of Diff.	VI^{h}.	P. L. of Diff.	IX^{h}.	P. L. of Diff.
22	α Aquilæ	W.	68° 27′ 10″	3693	69° 44′ 5″	3686	71° 1′ 7″	3679	72° 18′ 16″	3673
	Fomalhaut	W.	34 3 14	3924	35 16 9	3867	36 30 2	3817	37 44 47	3772
	Aldebaran	E.	65 20 21	3049	63 51 9	3054	62 22 3	3059	60 53 3	3063
23	Sun	W.	103 4 38	3473	104 25 32	3475	105 46 24	3476	107 7 15	3476
	α Aquilæ	W.	78 45 30	3649	80 3 12	3645	81 20 58	3641	82 38 48	3637
	Fomalhaut	W.	44 8 52	3605	45 27 21	3579	46 46 18	3556	48 5 40	3535
	Aldebaran	E.	53 29 7	3077	52 0 29	3078	50 31 52	3078	49 3 16	3078
	Pollux	E.	97 37 32	3123	96 9 50	3124	94 42 9	3124	93 14 28	3124
24	Sun	W.	113 51 37	3470	115 12 35	3467	116 33 36	3464	117 54 40	3461
	Fomalhaut	W.	54 47 57	3446	56 9 22	3431	57 31 4	3415	58 53 3	3401
	α Pegasi	W.	41 47 12	3942	42 59 49	3892	44 13 17	3847	45 27 31	3804
	Aldebaran	E.	41 40 9	3073	40 11 27	3071	38 42 42	3068	37 13 53	3064
	Pollux	E.	85 55 55	3119	84 28 8	3116	83 0 18	3113	81 32 24	3110
25	Fomalhaut	W.	65 46 50	3337	67 10 19	3324	68 34 3	3313	69 58 0	3300
	α Pegasi	W.	51 48 44	3633	53 6 43	3604	54 25 13	3576	55 44 13	3552
	Aldebaran	E.	29 48 37	3043	28 19 17	3037	26 49 50	3031	25 20 16	3025
	Pollux	E.	74 11 52	3090	72 43 30	3085	71 15 2	3080	69 46 28	3074
	Saturn	E.	87 3 15	3018	85 33 24	3012	84 3 26	3006	82 33 21	6000
26	Fomalhaut	W.	77 1 10	3243	78 26 28	3232	79 51 59	3221	81 17 43	3211
	α Pegasi	W.	62 25 48	3438	63 47 21	3419	65 9 16	3400	66 31 32	3382
	Pollux	E.	62 21 52	3044	60 52 34	3038	59 23 8	3031	57 53 34	3024
	Saturn	E.	75 0 45	2962	73 29 45	2954	71 58 35	2946	70 27 15	2937
	Regulus	E.	97 58 9	2985	96 27 38	2977	94 56 57	2969	93 26 6	2961
27	α Pegasi	W.	73 27 59	3298	74 52 13	3282	76 16 46	3266	77 41 37	3252
	α Arietis	W.	30 10 4	3565	31 29 16	3500	32 49 40	3441	34 11 10	3389
	Pollux	E.	50 23 38	2991	48 53 14	2985	47 22 43	2980	45 52 5	2974
	Saturn	E.	62 47 39	2890	61 15 7	2880	59 42 23	2870	58 9 26	2859
	Regulus	E.	85 48 57	2913	84 16 55	2903	82 44 40	2893	81 12 12	2883
28	α Arietis	W.	41 11 55	3189	42 38 17	3158	44 5 17	3128	45 32 53	3101
	Pollux	E.	38 17 19	2954	36 46 8	2953	35 14 56	2953	33 43 44	2954
	Saturn	E.	50 21 18	2808	48 47 0	2796	47 12 27	2785	45 37 40	2775
	Regulus	E.	73 26 34	2830	71 52 45	2819	70 18 42	2808	68 44 25	2798
29	α Arietis	W.	52 58 43	2983	54 29 17	2962	56 0 17	2943	57 31 41	2924
	Saturn	E.	37 40 12	2721	36 4 0	2710	34 27 33	2699	32 50 52	2689
	Regulus	E.	60 49 26	2743	59 13 43	2732	57 37 46	2722	56 1 35	2711
30	α Arietis	W.	65 14 16	2843	66 47 48	2828	68 21 40	2814	69 55 50	2800
	Regulus	E.	47 57 8	2659	46 19 33	2649	44 41 44	2639	43 3 42	2629
	Mars	E.	91 39 58	2818	90 5 53	2808	88 31 35	2797	86 57 3	2786
	Spica	E.	101 45 32	2690	100 8 39	2680	98 31 32	2670	96 54 12	2660
31	α Arietis	W.	77 50 55	2739	79 26 43	2729	81 2 45	2719	82 39 0	2708
	Regulus	E.	34 50 13	2582	33 10 53	2573	31 31 21	2565	29 51 38	2557
	Mars	E.	79 1 0	2736	77 25 8	2727	75 49 4	2718	74 12 48	2708
	Spica	E.	88 44 11	2612	87 5 32	2603	85 26 41	2594	83 47 38	2585

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
22	α Aquilæ	W.	73° 35′ 32″	3667	74° 52′ 54″	3663	76° 10′ 21″	3658	77° 27′ 53″	3653
	Fomalhaut	W.	39 0 18	3731	40 16 32	3695	41 33 24	3662	42 50 52	3632
	Aldebaran	E.	59 24 8	3066	57 55 17	3069	56 26 30	3073	54 57 47	3075
23	Sun	W.	108 28 6	3476	109 48 57	3475	111 9 49	3474	112 30 42	3472
	α Aquilæ	W.	83 56 42	3635	85 14 39	3631	86 32 40	3628	87 50 44	3626
	Fomalhaut	W.	49 25 26	3515	50 45 34	3497	52 6 2	3479	53 26 50	3462
	Aldebaran	E.	47 34 40	3078	46 6 4	3078	44 37 27	3077	43 8 49	3075
	Pollux	E.	91 46 47	3124	90 19 6	3123	88 51 24	3121	87 23 40	3120
24	Sun	W.	119 15 48	3456	120 37 1	3452	121 58 19	3447	123 19 42	3442
	Fomalhaut	W.	60 15 18	3388	61 37 48	3374	63 0 34	3361	64 23 35	3349
	α Pegasi	W.	46 42 29	3766	47 58 7	3728	49 14 24	3694	50 31 17	3663
	Aldebaran	E.	35 44 59	3060	34 16 1	3056	32 46 58	3052	31 17 50	3048
	Pollux	E.	80 4 26	3106	78 36 24	3103	77 8 18	3100	75 40 8	3095
25	Fomalhaut	W.	71 22 11	3288	72 46 36	3277	74 11 14	3266	75 36 5	3254
	α Pegasi	W.	57 3 40	3527	58 23 34	3504	59 43 54	3481	61 4 39	3460
	Aldebaran	E.	23 50 34	3019	22 20 45	3012	20 50 47	3005	19 20 40	2997
	Pollux	E.	68 17 47	3069	66 48 59	3063	65 20 4	3057	63 51 2	3051
	Saturn	E.	81 3 8	2993	79 32 46	2985	78 2 15	2978	76 31 35	2970
26	Fomalhaut	W.	82 43 39	3200	84 9 48	3189	85 36 10	3178	87 2 45	3168
	α Pegasi	W.	67 54 9	3364	69 17 7	3346	70 40 25	3329	72 4 3	3313
	Pollux	E.	56 23 51	3018	54 54 0	3011	53 24 1	3005	51 53 54	2997
	Saturn	E.	68 55 43	2928	67 24 0	2919	65 52 5	2909	64 19 58	2900
	Regulus	E.	91 55 4	2951	90 23 50	2942	88 52 24	2933	87 20 47	2923
27	α Pegasi	W.	79 6 45	3238	80 32 9	3224	81 57 50	3211	83 23 46	3198
	α Arietis	W.	35 33 39	3342	36 57 2	3300	38 21 14	3259	39 46 13	3223
	Pollux	E.	44 21 20	2969	42 50 28	2964	41 19 30	2960	39 48 27	2956
	Saturn	E.	56 36 15	2849	55 2 51	2839	53 29 14	2828	51 55 23	2818
	Regulus	E.	79 39 31	2873	78 6 37	2862	76 33 30	2852	75 0 9	2841
28	α Arietis	W.	47 1 2	3074	48 29 43	3049	49 58 55	3026	51 28 35	3004
	Pollux	E.	32 12 34	2958	30 41 28	2964	29 10 30	2973	27 39 43	2985
	Saturn	E.	44 2 39	2764	42 27 24	2753	40 51 54	2742	39 16 10	2732
	Regulus	E.	67 9 54	2787	65 35 9	2775	64 0 9	2765	62 24 55	2753
29	α Arietis	W.	59 3 29	2906	60 35 40	2890	62 8 12	2874	63 41 4	2859
	Saturn	E.	31 13 57	2678	29 36 48	2668	27 59 25	2657	26 21 48	2648
	Regulus	E.	54 25 10	2701	52 48 31	2689	51 11 37	2679	49 34 29	2669
30	α Arietis	W.	71 30 18	2787	73 5 3	2774	74 40 5	2763	76 15 22	2750
	Regulus	E.	41 25 26	2619	39 46 57	2610	38 8 15	2600	36 29 20	2591
	Mars	E.	85 22 17	2776	83 47 18	2766	82 12 5	2756	80 36 39	2746
	Spica	E.	95 16 39	2650	93 38 52	2640	92 0 51	2630	90 22 37	2621
31	α Arietis	W.	84 15 29	2698	85 52 11	2689	87 29 5	2681	89 6 10	2674
	Regulus	E.	28 11 44	2548	26 31 38	2540	24 51 21	2533	23 10 53	2525
	Mars	E.	72 36 19	2699	70 59 38	2691	69 22 46	2682	67 45 42	2674
	Spica	E.	82 8 23	2577	80 28 56	2569	78 49 18	2561	77 9 30	2554

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	17 20 48.68	+14.559	−22 25 18.1	−34.31	22 39.4
2	17 26 41.01	14.798	22 38 36.8	32.22	22 41.4
3	17 32 38.83	15.018	22 51 3.6	29.99	22 43.5
4	17 38 41.75	15.221	23 2 35.1	27.62	22 45.7
5	17 44 49.34	15.409	23 13 8.3	25.13	22 47.9
6	17 51 1.28	+15.584	−23 22 40.6	−22.54	22 50.2
7	17 57 17.27	15.747	23 31 9.6	19.86	22 52.6
8	18 3 37.02	15.898	23 38 33.0	17.08	22 55.1
9	18 10 0.26	16.038	23 44 48.7	14.22	22 57.6
10	18 16 26.75	16.169	23 49 54.9	11.28	23 0.1
11	18 22 56.29	+16.291	−23 53 49.8	− 8.28	23 2.7
12	18 29 28.66	16.405	23 56 31.9	5.21	23 5.4
13	18 36 3.68	16.511	23 57 59.5	− 2.08	23 8.1
14	18 42 41.16	16.611	23 58 11.4	+ 1.10	23 10.8
15	18 49 20.94	16.704	23 57 6.3	4.34	23 13.5
16	18 56 2.86	+16.790	−23 54 42.8	+ 7.62	23 16.3
17	19 2 46.79	16.863	23 51 0.0	10.96	23 19.2
18	19 9 32.55	16.943	23 45 56.6	14.33	23 22.0
19	19 16 20.01	17.011	23 39 31.9	17.74	23 24.9
20	19 23 9.07	17.075	23 31 44.8	21.19	23 27.8
21	19 29 59.58	+17.133	−23 22 34.3	+24.68	23 30.7
22	19 36 51.44	17.187	23 11 59.8	28.20	23 33.7
23	19 43 44.51	17.236	23 0 0.3	31.76	23 36.6
24	19 50 38.71	17.280	22 46 35.1	35.34	23 39.6
25	19 57 33.93	17.320	22 31 43.6	38.95	23 42.6
26	20 4 30.08	+17.357	−22 15 25.2	+42.59	23 45.6
27	20 11 27.06	17.390	21 57 39.2	46.25	23 48.7
28	20 18 24.77	17.419	21 38 25.1	49.93	23 51.7
29	20 25 23.14	17.445	21 17 42.3	53.64	23 54.7
30	20 32 22.08	17.467	20 55 30.5	57.35	23 57.8
31	20 39 21.54	+17.486	−20 31 49.3	+61.08	
32	20 46 21.44	+17.503	−20 6 38.3	+64.83	0 0.9

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	2″.8	2″.7	2″.5	2″.5	2″.4	2″.4	2″.4
Hor. Parallax . .	7.4	7.0	6.7	6.5	6.4	6.3	6.3

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	20 46 21.44	+17.503	−20 6 38.3	+ 64.83	0 0.9
2	20 53 21.67	17.517	19 39 57.3	68.59	0 3.9
3	21 0 22.19	17.527	19 11 46.1	72.35	0 7.0
4	21 7 22.92	17.533	18 42 4.7	76.11	0 10.1
5	21 14 23.76	17.536	18 10 53.2	79.86	0 13.1
6	21 21 24.64	+17.536	−17 38 11.7	+ 83.60	0 16.2
7	21 28 25.47	17.532	17 4 0.5	87.33	0 19.3
8	21 35 26.13	17.522	16 28 20.2	91.03	0 22.4
9	21 42 26.50	17.507	15 51 11.5	94.69	0 25.5
10	21 49 26.43	17.486	15 12 35.5	98.30	0 28.5
11	21 56 25.76	+17.457	−14 32 33.7	+101.84	0 31.6
12	22 3 24.29	17.418	13 51 7.6	105.32	0 34.6
13	22 10 21.76	17.368	13 8 19.4	108.68	0 37.6
14	22 17 17.88	17.305	12 24 12.0	111.91	0 40.6
15	22 24 12.31	17.227	11 38 48.8	114.99	0 43.6
16	22 31 4.64	+17.130	−10 52 13.8	+117.89	0 46.5
17	22 37 54.38	17.011	10 4 31.8	120.56	0 49.4
18	22 44 40.93	16.864	9 15 49.1	122.96	0 52.2
19	22 51 23.63	16.688	8 26 12.4	125.05	0 55.0
20	22 58 1.66	16.476	7 35 49.8	126.77	0 57.7
21	23 4 34.11	+16.222	− 6 44 50.9	+128.07	1 0.3
22	23 10 59.93	15.921	5 53 26.6	128.87	1 2.8
23	23 17 17.92	15.568	5 1 49.3	129.14	1 5.2
24	23 23 26.74	15.157	4 10 12.7	128.80	1 7.4
25	23 29 24.93	14.682	3 18 52.1	127.79	1 9.4
26	23 35 10.89	+14.136	− 2 28 4.3	+126.06	1 11.2
27	23 40 42.87	13.517	1 38 7.3	123.55	1 12.8
28	23 45 59.09	12.821	0 49 20.2	120.23	1 14.1
29	23 50 57.65	12.046	− 0 2 3.0	116.06	1 15.1
30	23 55 36.66	11.192	+ 0 43 24.0	111.05	1 15.8
31	23 59 54.24	+10.260	+ 1 26 40.4	+105.18	1 16.1
32	0 3 48.54	+ 9.253	+ 2 7 25.7	+ 98.46	1 16.1

Day of the Month.	5th.	10th.	15th.	20th.	25th.
Semidiameter.	2″.4	2″.4	2″.5	2″.7	2″.9
Horizontal Parallax . .	6.3	6.5	6.7	7.1	7.8

Note.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 50 57.65	+12.046	−0 2 3.0	+116.06	1 15.1
2	23 55 36.66	11.192	+0 43 24.0	111.05	1 15.8
3	23 59 54.24	10.260	1 26 40.4	105.18	1 16.1
4	0 3 48.54	9 253	2 7 25.7	98.46	1 16.1
5	0 7 17.85	− 8.177	2 45 20.0	90.93	1 15.6
6	0 10 20.57	+ 7.040	+3 20 4.1	+ 82.62	1 14.7
7	0 12 55.33	5.847	3 51 20.0	73.58	1 13.3
8	0 15 0.97	4.616	4 18 51.0	63.89	1 11.4
9	0 16 36.66	3.354	4 42 22.1	53.60	1 9.1
10	0 17 41.87	2.079	5 1 39.8	42.80	1 6.2
11	0 18 16.47	+ 0.807	+5 16 33.5	+ 31.62	1 2.8
12	0 18 20.77	− 0.444	5 26 55.2	20.15	0 58.9
13	0 17 55.48	1.654	5 32 39.3	+ 8.52	0 54.6
14	0 17 1.86	2.802	5 33 44.0	− 3.10	0 49.7
15	0 15 41.64	3.868	5 30 11.8	14.54	0 44.4
16	0 13 57.04	− 4.830	+5 22 9.2	− 25.61	0 38.7
17	0 11 50.77	5.670	5 9 47.0	36.12	0 32.7
18	0 9 25.99	6.370	4 53 21.6	45.86	0 26.4
19	0 6 46.23	6 917	4 33 13.6	54.62	0 19.8
20	0 3 55.29	7.300	4 9 49.0	62.23	0 13.0
21	0 0 57.14	− 7.517	+3 43 36.8	− 68.56	0 6.1 23 59.2
22	23 57 55.79	7.568	3 15 9.4	73.49	23 52.3
23	23 54 55.17	7.458	2 45 0.9	76.97	23 45.5
24	23 51 59.02	7.197	2 13 46.4	78.99	23 38.8
25	23 49 10.79	6.801	1 42 0.5	79.60	23 32.2
26	23 46 33.54	− 6.285	+1 10 16.2	− 78.87	23 25.9
27	23 44 9.90	5.669	0 39 4.4	76.92	23 19.8
28	23 42 2.06	4.972	+0 8 52.5	73.90	23 14.1
29	23 40 11.76	4.212	−0 19 55.4	69.95	23 8.6
30	23 38 40.26	3.408	0 46 59.2	65.26	23 3.3
31	23 37 28.41	− 2.576	−1 12 2.8	− 59.95	22 58.7
32	23 36 36.72	− 1.730	−1 34 53.1	− 54.18	22 54.2

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . . .	3″.3	3″.8	4″.5	5″.1	5″.5	5″.6
Horizontal Parallax	8.8	10.2	11.9	13.6	14.6	14.7

APRIL.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 36 36.72	− 1.730	−1 34 53.1	−54.18	22 54.2
2	23 36 5.37	0.883	1 55 20.9	48.08	22 50.1
3	23 35 54.26	− 0.044	2 13 19.4	41.78	22 46.3
4	23 36 3.10	+ 0.777	2 28 44.7	35.33	22 42.8
5	23 36 31.38	1.576	2 41 35.0	28.86	22 39.7
6	23 37 18.53	+ 2.348	−2 51 50.3	−22.42	22 36.8
7	23 38 23.84	3.089	2 59 31.5	16.04	22 34.2
8	23 39 46.55	3.798	3 4 41.1	9.78	22 31.9
9	23 41 25.87	4.473	3 7 22.2	− 3.67	22 29.9
10	23 43 20.98	5.115	3 7 38.4	+ 2.28	22 28.1
11	23 45 31.11	+ 5.724	−3 5 33.9	+ 8.07	22 26.5
12	23 47 55.47	6.301	3 1 12.8	13.66	22 25.2
13	23 50 33.31	6.848	2 54 39.7	19.06	22 24.1
14	23 53 23.91	7.364	2 45 59.2	24.28	22 23.2
15	23 56 26.57	7.853	2 35 15.7	29.31	22 22.5
16	23 59 40.67	+ 8.317	−2 22 33.8	+34.15	22 21.9
17	0 3 5.62	8.758	2 7 57.8	38.82	22 21.6
18	0 6 40.88	9.177	1 51 31.7	43.32	22 21.4
19	0 10 25.96	9.576	1 33 19.7	47.65	22 21.3
20	0 14 20.40	9.957	1 13 25.8	51.82	22 21.4
21	0 18 23.78	+10.322	−0 51 53.8	+55.82	22 21.7
22	0 22 35.75	10 674	0 28 47.4	59.68	22 22.1
23	0 26 56.02	11.013	−0 4 10.0	63.40	22 22.6
24	0 31 24.30	11.342	+0 21 54.7	66.98	22 23.3
25	0 36 0.37	11.663	0 49 23.8	70.42	22 24.0
26	0 40 44.05	+11.976	+1 18 13.9	+73.74	22 24.9
27	0 45 35.16	12.284	1 48 22.1	76.93	22 25.9
28	0 50 33.63	12.588	2 19 45.4	79.99	22 27.1
29	0 55 39.37	12.890	2 52 20.7	82.93	22 28.3
30	1 0 52.35	13.192	3 26 5.1	85.75	22 29.7
31	1 6 12.56	+13.493	+4 0 55.9	+88.46	22 31.2
32	1 11 40.03	+13.797	+4 36 50.1	+91.04	22 32.9

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter . .	5″.3	4″.9	4″.5	4″.1	3″.8	3″.5
Hor. Parallax . .	14.0	13.0	11.9	10.8	9.9	9.2

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	1 6 12.56	+13.493	+ 4 0 55.9	+ 88.46	22 31.2	1	5 1 32.58	+23.382	+24 3 37.6	+52.32	0 23.0
2	1 11 40.03	13.797	4 36 50.1	91.04	22 32.9	2	5 10 52.67	23.282	24 23 11.4	45.47	0 28.4
3	1 17 14.84	14.104	5 13 44.9	93.50	22 34.6	3	5 20 9.66	23.125	24 39 59.8	38.55	0 33.8
4	1 22 57.06	14.415	5 51 37.3	95.84	22 36.5	4	5 29 22.22	22.913	24 54 1.9	31.63	0 39.1
5	1 28 46.82	14.733	6 30 24.2	98.04	22 38.5	5	5 38 29.08	22.651	25 5 18.5	24.77	0 44.2
6	1 34 44.28	+15.057	+ 7 10 2.5	+100.11	22 40.7	6	5 47 29.10	+22.344	+25 13 51.9	+18.03	0 49.3
7	1 40 49.61	15.389	7 50 28.9	102.05	22 42.9	7	5 56 21.25	21.996	25 19 45.5	11.47	0 54.3
8	1 47 3.01	15.730	8 31 39.9	103.84	22 45.3	8	6 5 4.63	21.613	25 23 4.1	+ 5.12	0 59.1
9	1 53 24.71	16.080	9 13 31.8	105.46	22 47.9	9	6 13 38.43	21.199	25 23 53.1	− 1.00	1 3.7
10	1 59 54.93	16.440	9 56 0.6	106.91	22 50.6	10	6 22 1.98	20.759	25 22 18.2	6.85	1 8.2
11	2 6 33.93	+16.812	+10 39 1.9	+108.17	22 53.5	11	6 30 14.67	+20.296	+25 18 26.4	−12.41	1 12.4
12	2 13 21.97	17.194	11 22 31.0	109.22	22 56.5	12	6 38 16.05	19.816	25 12 24.8	17.67	1 16.5
13	2 20 19.31	17.586	12 6 22.8	110.05	22 59.7	13	6 46 5.71	19.320	25 4 20.6	22.63	1 20.4
14	2 27 26.20	17.990	12 50 31.4	110.62	23 3.0	14	6 53 43.29	18.812	24 54 20.9	27.29	1 24.1
15	2 34 42.90	18.403	13 34 50.6	110.93	23 6.5	15	7 1 8.57	18.294	24 42 33.3	31.63	1 27.6
16	2 42 9.60	+18.824	+14 19 13.7	+110.94	23 10.1	16	7 8 21.30	+17.767	+24 29 5.0	−35.67	1 30.8
17	2 49 46.48	19.251	15 3 32.9	110.61	23 14.0	17	7 15 21.31	17.234	24 14 3.6	39.40	1 33.8
18	2 57 33.67	19.682	15 47 40.0	109.92	23 18.0	18	7 22 8.47	16.695	23 57 36.1	42.84	1 36.7
19	3 5 31.23	20.114	16 31 25.9	108.84	23 22.2	19	7 28 42.65	16.152	23 39 49.7	45.98	1 39.3
20	3 13 30.13	20.543	17 14 40.7	107.32	23 26.6	20	7 35 3.74	15.605	23 20 51.4	48.84	1 41.7
21	3 21 57.23	+20.964	+17 57 13.7	+105.35	23 31.1	21	7 41 11.65	+16.054	+23 0 47.8	−51.42	1 43.9
22	3 30 25.28	21.371	18 38 53.9	102.91	23 35.8	22	7 47 6.29	14.499	22 39 45.7	53.72	1 45.9
23	3 39 2.89	21.759	19 19 29.4	99.96	23 40.7	23	7 52 47.57	13.940	22 17 51.7	55.74	1 47.6
24	3 47 49.50	22.122	19 58 47.8	96.49	23 45.7	24	7 58 15.39	13.377	21 55 12.3	57.50	1 49.1
25	3 56 44.44	22.451	20 36 36.7	92.50	23 50.8	25	8 3 29.63	12.809	21 31 53.6	59.01	1 50.4
26	4 5 46.84	+22.742	+21 12 42.9	+ 88.01	23 56.0	26	8 8 30.18	+12.236	+21 8 2.0	−60.25	1 51.4
27	4 14 55.69	22.987	21 46 57.3	83.02		27	8 13 16.89	11.656	20 43 43.6	61.24	1 52.2
28	4 24 9.82	23.182	22 19 5.4	77.58	0 1.3	28	8 17 49.60	11.069	20 19 4.6	61.97	1 52.8
29	4 33 27.98	23.322	22 48 58.0	71.73	0 6.7	29	8 22 8.13	10.474	19 54 11.0	62.45	1 53.1
30	4 42 48.78	23.402	23 16 25.7	65.52	0 12.1	30	8 26 12.29	9.871	19 29 9.1	62.68	1 53.3
31	4 52 10.80	+23.423	+23 41 20.9	+ 59.02	0 17.6	31	8 30 1.84	+ 9.257	+19 4 4.8	−62.65	1 53.1
32	5 1 32.58	+23.382	+24 3 37.6	+ 52.32	0 23.0	32	8 33 36.54	+ 8.633	+18 39 4.1	−62.36	1 52.7

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	3″.2	3″.0	2″.8	2″.7	2″.6	2″.5	2″.6
Hor. Parallax . .	8.5	7.9	7.4	7.1	6.8	6.7	6.8

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	2″.7	2″.8	3″.0	3″.3	3″.6	3″.9
Hor. Parallax . .	7.0	7.4	8.0	8.7	9.5	10.5

Note.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	8 30 1.84	+9.257	+19 4 4.8	−62.65	1 53.1
2	8 33 36.54	8.633	18 39 4.1	62.36	1 52.7
3	8 36 56.11	7.996	18 14 13.6	61.81	1 52.1
4	8 40 0.25	7.346	17 49 39.5	61.00	1 51.2
5	8 42 48.63	6.683	17 25 27.8	59.93	1 50.1
6	8 45 20.93	+6.006	+17 1 45.2	−58.58	1 48.6
7	8 47 36.79	5.313	16 38 38.2	56.95	1 46.9
8	8 49 35.85	4.605	16 16 13.6	55.04	1 45.0
9	8 51 17.73	3.882	15 54 38.2	52.85	1 42.7
10	8 52 42.05	3.144	15 33 58.9	50.38	1 40.1
11	8 53 48.52	+2.392	+15 14 22.5	−47.61	1 37.3
12	8 54 36.78	1.628	14 55 56.2	44.54	1 34.2
13	8 55 6.58	0.853	14 38 47.1	41.18	1 30.7
14	8 55 17.69	+0.072	14 23 2.2	37.53	1 26.9
15	8 55 10.01	−0.712	14 8 48.2	33.60	1 22.8
16	8 54 43.53	−1.494	+13 56 11.7	−29.40	1 18.4
17	8 53 58.38	2.267	13 45 19.1	24.95	1 13 7
18	8 52 54.87	3 023	13 36 15.9	20.28	1 8.8
19	8 51 33.49	3.754	13 29 7.2	15.42	1 3.5
20	8 49 54.94	4.451	13 23 57.2	10.40	0 57.9
21	8 48 0.23	−5.100	+13 20 49.1	− 5.27	0 52.0
22	8 45 50.61	5.691	13 19 44.8	− 0.09	0 45.9
23	8 43 27.63	6.211	13 20 44.6	+ 5.08	0 39.6
24	8 40 53.16	6.646	13 23 47.6	10.16	0 33.1
25	8 38 9.36	6.987	13 28 51.1	15.10	0 26.5
26	8 35 18.65	−7.221	+13 35 50.6	+19.81	0 19.8
27	8 32 23.69	7.338	13 44 39.8	24.23	0 13.0
28	8 29 27.42	7.329	13 55 10.9	28.29	0 6.1 23 59.3
29	8 26 32.91	7.190	14 7 14.5	31.93	23 52.5
30	8 23 43.30	6.920	14 20 39.8	35.10	23 45.9
31	8 21 1.74	−6.521	+14 35 15.1	+37.75	23 39.5
32	8 18 31.32	−5.994	+14 50 47.6	+39.86	23 33.3

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	4″.3	4″.8	5″.2	5″.5	5″.7	5″.6
Hor. Parallax . .	11.5	12.6	13.7	14.7	15.1	14.7

AUGUST.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	8 18 31.32	− 5.994	+14 50 47.6	+39.86	23 33.3
2	8 16 15.03	5.344	15 7 4.0	41.41	23 27.4
3	8 14 15.71	4.582	15 23 50.7	42.38	23 21.8
4	6 12 35.92	3.718	15 40 53.7	42.77	23 16.6
5	8 11 17.98	2.764	15 57 59.3	42.60	23 11.7
6	8 10 23.88	− 1.733	+16 14 54.0	+41.86	23 7.3
7	8 9 55.32	− 0.638	16 31 24.4	40.58	23 3.3
8	8 9 53.68	+ 0 508	16 47 17.5	38.76	22 59.8
9	8 10 20.03	1.693	17 2 20.6	36.42	22 56.8
10	8 11 15.16	2.904	17 16 21.4	33.56	22 54.2
11	8 12 39.53	+ 4.129	+17 29 7.7	+30.21	22 52.2
12	8 14 33.36	5.358	17 40 27.9	26.38	22 50.6
13	8 16 56.63	6.580	17 50 10.5	22.08	22 49.5
14	8 19 49.06	7.785	17 58 4.4	17.33	22 48.9
15	8 23 10.12	8.965	18 3 58.8	12.13	22 48.7
16	8 26 59.11	+10.110	+18 7 43.4	+ 6.52	22 49.0
17	8 31 15.07	11.212	18 9 8.6	+ 0.52	22 49.7
18	8 35 56.86	12.261	18 8 5.4	− 5.84	22 50.9
19	8 41 3.10	13.249	18 4 26.0	12.50	22 52.4
20	8 46 32.26	14.169	17 58 3.6	19.41	22 54.3
21	8 52 22.61	+15.014	+17 48 53.0	−26.51	22 56.5
22	8 58 32.27	15.777	17 36 50.3	33.72	22 59.0
23	9 4 59.23	16.453	17 21 53.9	40.97	23 1.8
24	9 11 41.38	17.042	17 4 3.9	48.18	23 4.8
25	9 18 36.57	17.541	16 43 22.2	55.26	23 7.9
26	9 25 42.64	+17.950	+16 19 52.8	−62.14	23 11.2
27	9 32 57.46	18.270	15 53 41.7	68.74	23 14.6
28	9 40 18.96	18.508	15 24 56.1	75.00	23 18.1
29	9 47 45.23	18.668	14 53 45.1	80.85	23 21.7
30	9 55 14.48	18.758	14 20 18.5	86.28	23 25.3
31	10 2 45.12	+18.785	+13 44 47.1	−91.25	23 28.8
32	10 10 15.71	+18.757	+13 7 22.0	−95.76	23 32.4

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .	5″.1	4″.6	3″.9	3″.4	3″.0	2″.7
Hor. Parallax . .	13.6	12.1	10.4	9.0	8.0	7.2

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	10 10 15.71	+18.757	+13 7 22.0	− 95.76	23 32.4
2	10 17 45.06	18.692	12 28 14.5	99.79	23 35.9
3	10 25 12.12	18.568	11 47 35.8	103.36	23 39.4
4	10 32 36.05	18.422	11 5 36.8	106.48	23 42.8
5	10 39 56.17	18.252	10 22 27.9	109.18	23 46.1
6	10 47 11.98	+18.063	+ 9 38 19.1	−111.48	23 49.4
7	10 54 23.07	17.860	8 53 19.7	113.41	23 52.5
8	11 1 29.19	17.649	8 7 38.2	114.99	23 55.6
9	11 8 30.16	17.432	7 21 22.6	116.26	23 58.6
10	11 15 25.90	17.214	6 34 40.1	117.24	
11	11 22 16.42	+16.996	+ 5 47 37.2	−117.96	0 1.5
12	11 29 1.74	16.782	5 0 20.0	118.44	0 4.3
13	11 35 41.97	16.572	4 12 53.9	118.71	0 7.1
14	11 42 17.22	16.367	3 25 23.8	118.78	0 9.7
15	11 48 47.66	16.170	2 37 53.9	118.68	0 12.3
16	11 55 13.46	+15.981	+ 1 50 28.4	−118.42	0 14.8
17	12 1 34.81	15.799	1 3 10.8	118.02	0 17.2
18	12 7 51.89	15.626	+ 0 16 4.3	117.49	0 19.5
19	12 14 4.91	15.461	− 0 30 48.0	116.84	0 21.8
20	12 20 14.08	15.305	1 17 23.5	116.10	0 24.0
21	12 26 19.61	+15.157	− 2 3 39.8	−115.25	0 26.2
22	12 32 21.67	15.017	2 49 34.6	114.30	0 28.3
23	12 38 20.48	14.885	3 35 5.8	113.28	0 30.3
24	12 44 16.23	14.762	4 20 11.7	112.19	0 32.3
25	12 50 9.10	14.646	5 4 50.3	111.02	0 34.2
26	12 55 59.27	+14.536	− 5 49 0.1	−109.78	0 36.1
27	13 1 46.90	14.434	6 32 39.5	108.47	0 38.0
28	13 7 32.15	14.338	7 15 46.9	107.12	0 39.8
29	13 13 15.16	14.248	7 58 21.1	105.71	0 41.6
30	13 18 56.07	14.163	8 40 20.6	104.24	0 43.3
31	13 24 35.01	+14.083	− 9 21 44.0	−102.70	0 45.0
32	13 30 12.08	+14.007	−10 2 30.0	−101.12	0 46.7

OCTOBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	13 24 35.01	+14.083	− 9 21 44.0	−102.70	0 45.0
2	13 30 12.08	14.007	10 2 30.0	101.12	0 46.7
3	13 35 47.38	13.935	10 42 37.4	99.48	0 48.4
4	13 41 21.00	13.867	11 22 4.9	97.80	0 50.0
5	13 46 53.00	13.801	12 0 51.3	96.06	0 51.6
6	13 52 23.44	+13.736	−12 38 55.2	− 94.26	0 53.1
7	13 57 52.33	13.672	13 16 15.2	92.40	0 54.7
8	14 3 19.69	13.608	13 52 50.1	90.49	0 56.2
9	14 8 45.52	13.544	14 28 38.4	88.52	0 57.7
10	14 14 9.77	13.477	15 3 38.6	86.49	0 59.2
11	14 19 32.39	+13.407	−15 37 49.3	− 84.39	1 0.6
12	14 24 53.27	13.332	16 11 8.9	82.23	1 2.0
13	14 30 12.31	13.252	16 43 35.7	79.99	1 3.3
14	14 35 29.34	13.165	17 15 8.0	77.69	1 4.7
15	14 40 44.17	13.069	17 45 44.1	75.31	1 6.0
16	14 45 56.56	+12.962	−18 15 22.0	− 72.84	1 7.3
17	14 51 6.22	12.841	18 43 59.6	70.28	1 8.5
18	14 56 12.81	12.705	19 11 34.7	67.63	1 9.6
19	15 1 15.93	12.551	19 38 5.0	64.88	1 10.7
20	15 6 15.10	12.376	20 3 28.1	62.03	1 11.8
21	15 11 9.78	+12.177	−20 27 41.4	− 59.06	1 12.8
22	15 15 59.35	11.950	20 50 42.0	55.97	1 13.6
23	15 20 43.10	11.691	21 12 26.9	52.75	1 14.4
24	15 25 20.20	11.395	21 32 52.7	49.38	1 15.1
25	15 29 49.71	11.057	21 51 56.1	45.85	1 15.6
26	15 34 10.57	+10.672	−22 9 32.7	− 42.16	1 16.0
27	15 38 21.56	10.234	22 25 38.6	38.29	1 16.2
28	15 42 21.33	9.736	22 40 9.1	34.22	1 16.3
29	15 46 8.34	9.170	22 52 59.2	29.92	1 16.1
30	15 49 40.87	8.528	23 4 3.1	25.36	1 15.7
31	15 52 57.01	+ 7.802	−23 13 14.4	− 20.54	1 15.0
32	15 55 54.65	+ 6.985	−23 20 26.2	− 15.40	1 14.0

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″
Semidiameter . .	2.6	2.5	2.4	2.4	2.4	2.5
Hor. Parallax . .	6.8	6.5	6.4	6.3	6.4	6.5

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″
Semidiameter . .	2.5	2.6	2.7	2.9	3.1	3.4
Hor. Parallax . .	6.7	6.9	7.2	7.6	8.2	8.9

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	15 55 54.65	+ 6.985	−23 20 26.2	−15.40	1 14.0	1	15 9 32.42	+ 6.450	−15 2 19.5	−31.38	22 28.4
2	15 58 31.47	6.066	23 25 30.7	9.92	1 12.7	2	15 12 20.46	7.533	15 16 12.1	37.83	22 27.6
3	16 0 44.96	5.039	23 28 19.2	− 4.06	1 11.0	3	15 15 33.05	8.498	15 32 27.0	43.25	22 27.2
4	16 2 32.44	3.898	23 28 42.2	+ 2.22	1 8.8	4	15 19 7.50	9.357	15 50 40.5	47.72	22 27.1
5	16 3 51.13	2.639	23 26 29.2	8.95	1 6.1	5	15 23 1.43	10.122	16 10 30.7	51.32	22 27.4
6	16 4 38.17	+ 1.262	−23 21 28.8	+16.17	1 2.9	6	15 27 12.68	+10.802	−16 31 37.9	−54.15	22 27.9
7	16 4 50.79	− 0.229	23 13 28.8	23.91	0 59.2	7	15 31 39.31	11.406	16 53 44.6	56.29	22 28.6
8	16 4 26.41	1.819	23 2 17.0	32.15	0 54.9	8	15 36 19.62	11.944	17 16 35.0	57.81	22 29.5
9	16 3 22.88	3.485	22 47 41.7	40.86	0 49.9	9	15 41 12.14	12.423	17 39 55.2	58.79	22 30.6
10	16 1 38.79	5.194	22 29 32.6	49.95	0 44.2	10	15 46 15 54	12.852	18 3 33.0	59.28	22 31.9
11	15 59 13.66	− 6.895	−22 7 42.7	+59.24	0 37.8	11	15 51 28.71	+13.238	−18 27 17.5	−59.35	22 33.3
12	15 56 8.37	8.529	21 42 9.9	68.46	0 30.8	12	15 56 50.66	13.586	18 50 59.1	59.06	22 34.9
13	15 52 25.39	10.022	21 13 0.1	77.26	0 23.2	13	16 2 20.55	13.900	19 14 29.6	58.43	22 36.5
14	15 48 9.06	11.295	20 40 28.7	85.17	0 15.0	14	16 7 57.62	14.185	19 37 41.4	57.51	22 38.3
15	15 43 25.62	12.268	20 5 3.3	91.64	0 6.2 23 57.4	15	16 13 41.22	14.445	20 0 28.0	56.33	22 40.1
16	15 38 23.13	−12.872	−19 27 25.6	+96.14	23 48.4	16	16 19 30.81	+14.683	−20 22 43.5	−54.92	22 42.1
17	15 33 11.07	13.059	18 48 28.2	98.18	23 39.3	17	16 25 25.88	14.903	20 44 22.8	53.32	22 44.2
18	15 27 59.74	12.810	18 9 14.8	97.43	23 30.4	18	16 31 26.02	15.106	21 5 21.4	51.54	22 46.3
19	15 22 59.55	12.137	17 30 54.6	93.75	23 21.8	19	16 37 30.86	15.295	21 25 35.2	49.59	22 48.5
20	15 18 20.22	11.078	16 54 36.7	87.31	23 13.7	20	16 43 40.06	15.470	21 45 0.4	47.49	22 50.8
21	15 14 10.31	− 9.703	−16 21 23.2	+78.42	23 6.2	21	16 49 53.32	+15.636	−22 3 33.6	−45.26	22 53.2
22	15 10 36.36	8.093	15 52 7.5	67.62	22 59.4	22	16 56 10.41	15.789	22 21 12.0	42.92	22 55.6
23	15 7 43.06	6.330	15 27 27.7	55.53	22 53.3	23	17 2 31.11	15.935	22 37 52.6	40.46	22 58.0
24	15 5 33.13	4.493	15 7 47.4	42.77	22 47.9	24	17 8 55.21	16.072	22 53 33.0	37.90	23 0.5
25	15 4 7.45	2.652	14 53 15.7	29.90	22 43.3	25	17 15 22.51	16.202	23 8 10.9	35.25	23 3.1
26	15 3 25.48	− 0.858	−14 43 49.7	+17.37	22 39.3	26	17 21 52.85	+16.326	−23 21 44.1	−32.51	23 5.7
27	15 3 25.57	+ 0.845	14 39 16.4	+ 5.55	22 36.0	27	17 28 26.09	16.443	23 34 10.7	29.69	23 8.4
28	15 4 5.28	2.441	14 39 16.1	− 5.34	22 33.3	28	17 35 2.06	16.554	23 45 28.7	26.80	23 11.1
29	15 5 21.74	3.908	14 43 24.3	15.16	22 31.2	29	17 41 40.64	16.660	23 55 36.3	23.83	23 13.8
30	15 7 11.83	5.244	14 51 14.6	23.84	22 29.6	30	17 48 21.71	16.761	24 4 31.9	20.80	23 16.6
31	15 9 32.42	+ 6.450	−15 2 19.5	−31.38	22 28.4	31	17 55 5.15	+16.857	−24 12 14.1	−17.71	23 19.4
32	15 12 20.46	+ 7.533	−15 16 12.1	−37.83	22 27.6	32	18 1 50.82	+16.948	−24 18 41.5	−14.56	23 22.3

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter . .	3.8	4.2	4.7	4.9	4.6	4.1
Hor. Parallax . .	9.9	11.2	12.5	13.1	12.3	10.8

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
	″	″	″	″	″	″	″
Semidiameter . .	3.5	3.2	2.9	2.7	2.5	2.5	2.4
Hor. Parallax . .	9.4	8.3	7.6	7.6	6.7	6.5	6.3

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	19 17 54.59	+13.602	−23 13 24.4	+20.45	0 34.7	1	21 57 59.29	+12.116	−14 1 13.4	+64.15	1 12.5
2	19 23 20.67	13.571	23 4 52.2	22.23	0 36.2	2	22 2 49.47	12.066	13 35 22.5	65.06	1 13.4
3	19 28 45.98	13.538	22 55 37.6	23.99	0 37.7	3	22 7 38.47	12.017	13 9 9.8	65.97	1 14.3
4	19 34 10.47	13.502	22 45 40.9	25.73	0 39.1	4	22 12 26.32	11.970	12 42 36.0	66.83	1 15.2
5	19 39 34.10	13.465	22 35 2.6	27.46	0 40.6	5	22 17 13.05	11.923	12 15 42.0	67.65	1 16.0
6	19 44 56.80	+13.426	−22 23 43.1	+29.17	0 42.0	6	22 21 58.68	+11.878	−11 48 28.6	+68.45	1 16.8
7	19 50 18.54	13.385	22 11 43.0	30.85	0 43.4	7	22 26 43.23	11.834	11 20 56.5	69.22	1 17.6
8	19 55 39.29	13.343	21 59 2.6	32.51	0 44.8	8	22 31 26.74	11.791	10 53 6.5	69.95	1 18.4
9	20 0 59.01	13.299	21 45 42.6	34.15	0 46.2	9	22 36 9.24	11.750	10 24 59.3	70.65	1 19.1
10	20 6 17.66	13.254	21 31 43.5	35.77	0 47.6	10	22 40 50.76	11.710	9 56 35.6	71.32	1 19.9
11	20 11 35.20	+13.208	−21 17 5.8	+37.36	0 49.0	11	22 45 31.34	+11.672	− 9 27 56.4	+71.95	1 20.6
12	20 16 51.61	13.161	21 1 50.2	38.93	0 50.3	12	22 50 11.02	11.635	8 59 2.4	72.55	1 21 4
13	20 22 6.87	13.112	20 45 57.3	40.48	0 51.6	13	22 54 49.84	11.600	8 29 54.3	73.12	1 22.1
14	20 27 20.95	13.062	20 29 27.6	42.00	0 52.9	14	22 59 27.82	11.566	8 0 33.0	73.65	1 22.8
15	20 32 33.83	13.011	20 12 21.9	43.49	0 54.2	15	23 4 5.02	11.534	7 30 59.1	74.15	1 23.5
16	20 37 45.49	+12.960	−19 54 40.7	+44.95	0 55.4	16	23 8 41.47	+11.504	− 7 1 13.4	+74.63	1 24.2
17	20 42 55.92	12.908	19 36 24.8	46.38	0 56.6	17	23 13 17.20	11.475	6 31 16.6	75.07	1 24.8
18	20 48 5.10	12.856	19 17 34.8	47.78	0 57.8	18	23 17 52.25	11.447	6 1 9.6	75.49	1 25.4
19	20 53 13.01	12 803	18 58 11.5	49.15	0 59.0	19	23 22 26.66	11.421	5 30 53.1	75.87	1 26.0
20	20 58 19.64	12.750	18 38 15.6	50.49	1 0.2	20	23 27 0.47	11.397	5 0 28.0	76.22	1 26.6
21	21 3 24.99	+12.696	−18 17 47.8	+51.81	1 1.4	21	23 31 33.72	+11.375	− 4 29 54.9	+76.53	1 27.2
22	21 8 29.06	12.643	17 56 48.8	53.10	1 2.5	22	23 36 6.44	11.354	3 59 14.5	76.82	1 27.8
23	21 13 31.85	12.589	17 35 19.3	54.35	1 3.7	23	23 40 38.69	11.335	3 28 27.6	77.08	1 28.4
24	21 18 33.34	12 536	17 13 20.2	55.57	1 4.8	24	23 45 10.50	11.317	2 57 35.0	77.30	1 29.0
25	21 23 33.53	12.482	16 50 52.3	56.75	1 5.9	25	23 49 41.90	11.301	2 26 37.5	77.48	1 29.6
26	21 28 32.44	+12.429	−16 27 56.2	+57.91	1 6.9	26	23 54 12.93	+11.286	− 1 55 35.9	+77.64	1 30.2
27	21 33 30.07	12.375	16 4 32.8	59.03	1 7.9	27	23 58 43.64	11.273	1 24 30.9	77.76	1 30.7
28	21 38 26.42	12.322	15 40 42.9	60.12	1 8.8	28	0 3 14.06	11.262	0 53 23.2	77.86	1 31.3
29	21 43 21.50	12.269	15 16 27.2	61.18	1 9.8	29	0 7 44.24	11.253	− 0 22 13.6	77.92	1 31.8
30	21 48 15.33	12.217	14 51 46.5	62.20	1 10.7	30	0 12 14.22	11.245	+ 0 8 57.2	77.96	1 32.4
31	21 53 7.92	+12.166	−14 26 41.7	+63.19	1 11.6	31	0 16 44.03	+11.239	+ 0 40 8.4	+77.96	1 33.0
32	21 57 59.29	+12.116	−14 1 13.4	+64.15	1 12.5	32	0 21 13.72	+11.235	+ 1 11 19.3	+77.94	1 33.6

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter	5″.0	5″.1	5″.1	5″.1	5″.1	5″.2	5″.2
Hor. Parallax	5 2	5.2	5.3	5.3	5.3	5.4	5.4

Day of the Month.	5th.	10th.	15th.	20th.	25th.
Semidiameter	5″.2	5″.3	5″.3	5″.4	5″.4
Horizontal Parallax	5.4	5.5	5.5	5.6	5.6

Note.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	0 7 44.24	+11.253	− 0 22 13.6	+77.92	1 31.8
2	0 12 14.22	11.245	+ 0 8 57.2	77.96	1 32.4
3	0 16 44.03	11.239	0 40 8.4	77.96	1 33.0
4	0 21 13.72	11.235	1 11 19.3	77.94	1 33.6
5	0 25 43.33	11.233	1 42 29.2	77.88	1 34.1
6	0 30 12.91	+11.232	+ 2 13 37.2	+77.79	1 34.7
7	0 34 42.50	11.234	2 44 42.8	77.67	1 35.2
8	0 39 12.14	11.237	3 15 45.1	77.52	1 35.8
9	0 43 41.87	11.242	3 46 43.5	77.34	1 36.3
10	0 48 11.73	11.248	4 17 37.2	77.13	1 36.9
11	0 52 41.78	+11.257	+ 4 48 25.4	+76.89	1 37.5
12	0 57 12.05	11.267	5 19 7.4	76.61	1 38.1
13	1 1 42.59	11.279	5 49 42.6	76.31	1 38.7
14	1 6 13.45	11.293	6 20 10.2	75.98	1 39.3
15	1 10 44.65	11.308	6 50 29.5	75.62	1 39.8
16	1 15 16.25	+11.325	+ 7 20 39.7	+75.23	1 40.4
17	1 19 48.27	11.344	7 50 40.2	74.81	1 40.9
18	1 24 20.75	11.364	8 20 30.1	74.35	1 41.5
19	1 28 53.74	11.386	8 50 8.8	73.87	1 42.1
20	1 33 27.26	11.409	9 19 35.5	73.35	1 42.7
21	1 38 1.37	+11.434	+ 9 48 49.6	+72.81	1 43.3
22	1 42 36.10	11.460	10 17 50.3	72.24	1 43.9
23	1 47 11.47	11.487	10 46 36.7	71.63	1 44.6
24	1 51 47.51	11.516	11 15 8.2	70.99	1 45.2
25	1 56 24.25	11.546	11 43 23.9	70.32	1 45.9
26	2 1 1.72	+11.577	+12 11 23.3	+69.62	1 46.6
27	2 5 39.94	11.609	12 39 5.4	68.88	1 47.3
28	2 10 18.95	11.642	13 6 29.5	68.12	1 48.0
29	2 14 58.76	11.676	13 33 35.0	67.32	1 48.7
30	2 19 39.40	11.711	14 0 21.0	66.50	1 49.4
31	2 24 20.89	+11.746	+14 26 46.8	+65.65	1 50.2
32	2 29 3.24	+11.783	+14 52 51.7	+64.76	1 51.0

APRIL.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	2 29 3.24	+11.783	+14 52 51.7	+64.76	1 51.0
2	2 33 46.49	11.821	15 18 34.9	63.84	1 51.8
3	2 38 30.65	11.859	15 43 55.6	62.89	1 52.6
4	2 43 15.73	11.898	16 8 53.1	61.91	1 53.4
5	2 48 1.74	11.937	16 33 26.7	60.90	1 54.2
6	2 52 48.70	+11.977	+16 57 35.8	+59.86	1 55.1
7	2 57 36.63	12.017	17 21 19.5	58.78	1 56.0
8	3 2 25.54	12.058	17 44 37.2	57.68	1 56.8
9	3 7 15.43	12.099	18 7 28.1	56.55	1 57.7
10	3 12 6.30	12.140	18 29 51.6	55.39	1 58.6
11	3 16 58.17	+12.182	+18 51 46.9	+54.21	1 59.5
12	3 21 51.05	12.224	19 13 13.3	52.99	2 0.5
13	3 26 44.92	12.266	19 34 10.2	51.75	2 1.4
14	3 31 39.80	12.308	19 54 36.9	50.48	2 2.4
15	3 36 35.67	12.349	20 14 32.7	49.18	2 3.4
16	3 41 32.52	+12.390	+20 33 57.1	+47.85	2 4.4
17	3 46 30.34	12.430	20 52 49.4	46.50	2 5.4
18	3 51 29.13	12.469	21 11 9.0	45.12	2 6.5
19	3 56 28.86	12.508	21 28 55.1	43.72	2 7.5
20	4 1 29.51	12.546	21 46 7.2	42.29	2 8.6
21	4 6 31.06	+12.583	+22 2 44.8	+40.84	2 9.6
22	4 11 33.48	12.619	22 18 47.2	39.36	2 10.7
23	4 16 36.75	12.653	22 34 13.9	37.86	2 11.8
24	4 21 40.82	12.686	22 49 4.3	36.34	2 12.9
25	4 26 45.66	12.717	23 3 17.9	34.79	2 14.0
26	4 31 51.23	+12.747	+23 16 54.1	+33.22	2 15.2
27	4 36 57.50	12.775	23 29 52.5	31.64	2 16.4
28	4 42 4.42	12.801	23 42 12.6	30.04	2 17.6
29	4 47 11.93	12.825	23 53 54.0	28.41	2 18.8
30	4 52 19.99	12.847	24 4 56.3	26.77	2 20.1
31	4 57 28.56	+12.867	+24 15 19.1	+25.12	2 21.3
32	5 2 37.57	+12.884	+24 25 2.0	+23.45	2 22.5

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . . .	5″.5	5″.6	5″.6	5″.7	5″.8	5″.9
Horizontal Parallax	5.7	5.8	5.8	5.9	6.0	6.1

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter . .	6″.0	6″.1	6″.2	6″.4	6″.5	6″.7
Hor. Parallax . .	6.2	6.3	6.5	6.6	6.7	6.9

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	4 57 28.56	+12.867	+24 15 19.1	+25.12	2 21.3
2	5 2 37.57	12.884	24 25 2.0	23.45	2 22.5
3	5 7 46.97	12.899	24 34 4.8	21.77	2 23.7
4	5 12 56.71	12.912	24 42 26.9	20.07	2 24.9
5	5 18 6.73	12.922	24 50 8.1	18.36	2 26.1
6	5 23 16.97	+12.930	+24 57 8.3	+16.64	2 27.4
7	5 28 27.37	12.936	25 3 27.2	14.92	2 28.6
8	5 33 37.87	12.939	25 9 4.6	13.19	2 29.8
9	5 38 48.42	12.940	25 14 0.4	11.45	2 31.0
10	5 43 58.95	12.938	25 18 14.4	9.71	2 32.3
11	5 49 9.39	+12.933	+25 21 46.5	+ 7.96	2 33.5
12	5 54 19.69	12.925	25 24 36.7	6.22	2 34.7
13	5 59 29.78	12.915	25 26 44.9	4.47	2 35.9
14	6 4 39.59	12.902	25 28 11.1	2.72	2 37.2
15	6 9 49.07	12.887	25 28 55.4	+ 0.97	2 38.4
16	6 14 58.14	+12.869	+25 28 57.8	− 0.77	2 39.6
17	6 20 6.74	12.848	25 28 18.5	2.51	2 40.8
18	6 25 14.81	12.824	25 26 57.4	4.24	2 42.0
19	6 30 22.27	12.797	25 24 54.8	5.97	2 43.2
20	6 35 29.06	12.767	25 22 10.9	7.69	2 44.3
21	6 40 35.11	+12.735	+25 18 45.9	− 9.40	2 45.5
22	6 45 40.35	12.700	25 14 40.0	11.10	2 46.6
23	6 50 44.71	12.662	25 9 53.6	12.78	2 47.7
24	6 55 48.13	12.622	25 4 26.8	14.45	2 48.8
25	7 0 50.55	12.579	24 58 20.1	16.11	2 49.9
26	7 5 51.89	+12.533	+24 51 33.8	−17.75	2 51.0
27	7 10 52.10	12.484	24 44 8.2	19.38	2 52.1
28	7 15 51.10	12.433	24 36 3.9	20.98	2 53.1
29	7 20 48.84	12.379	24 27 21.3	22.57	2 54.1
30	7 25 45.26	12.323	24 18 0.7	24.14	2 55.1
31	7 30 40.31	+12.264	+24 8 2.7	−25.69	2 56.1
32	7 35 33.92	+12.203	+23 57 27.8	−27.22	2 57.1

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter . .	6.8	7.0	7.2	7.4	7.7	7.9	8.2
Hor. Parallax . .	7.1	7.3	7.5	7.7	7.9	8.2	8.5

JUNE.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	7 35 33.92	+12 203	+23 57 27.8	−27.22	2 57.1
2	7 40 26.06	12.141	23 46 16.6	28.72	2 58.0
3	7 45 16.06	12.077	23 34 29.5	30.20	2 58.9
4	7 50 5.69	12.010	23 22 7.2	31.66	2 59.8
5	7 54 53.11	11.942	23 9 10.2	33.09	3 0.6
6	7 59 38.87	+11.872	+22 55 39.1	−34.50	3 1.4
7	8 4 22.94	11.801	22 41 34.6	35.88	3 2.2
8	8 9 5.29	11.728	22 26 57.3	37.23	3 3.0
9	8 13 45.88	11.654	22 11 47.7	38.56	3 3.7
10	8 18 24.68	11.579	21 56 6.6	39.86	3 4.4
11	8 23 1.66	+11.503	+21 39 54.6	−41.13	3 5.1
12	8 27 36.81	11.426	21 23 12.4	42.38	3 5.7
13	8 32 10.09	11.348	21 6 0.7	43.60	3 6.3
14	8 36 41.49	11 269	20 48 20.2	44.78	3 6.9
15	8 41 10.98	11.189	20 30 11.5	45.93	3 7.4
16	8 45 38.55	+11.108	+20 11 35.4	−47.06	3 7.9
17	8 50 4.17	11.026	19 52 32.6	48.16	3 8.4
18	8 54 27.82	10.944	19 33 3.8	49.23	3 8.9
19	8 58 49.48	10.861	19 13 9.8	50.27	3 9.3
20	9 3 9.14	10.778	18 52 51.3	51.27	3 9.7
21	9 7 26.79	+10.693	+18 32 9.0	−52 24	3 10.1
22	9 11 42.40	10.608	18 11 3.8	53.18	3 10.4
23	9 15 55.96	10.522	17 49 36.3	54.10	3 10.7
24	9 20 7.45	10.435	17 27 47.2	54.98	3 10.9
25	9 24 16.84	10.347	17 5 37.4	55.83	3 11.1
26	9 28 24.12	+10.259	+16 43 7.6	−56.65	3 11.3
27	9 32 29.28	10.170	16 20 18.6	57.43	3 11.4
28	9 36 32.31	10.081	15 57 11.2	58.18	3 11.5
29	9 40 33.18	9.991	15 33 46.3	58.90	3 11.6
30	9 44 31.88	9.900	15 10 4.5	59.58	3 11.6
31	9 48 28.39	+ 9.809	+14 46 6.6	−60.24	3 11.5
32	9 52 22.71	+ 9.717	+14 21 53.4	−60.86	3 11.5

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
Semidiameter . .	8.5	8.9	9.2	9.6	10.1	10.6
Hor. Parallax . .	8.8	9.2	9.6	10.0	10.5	11.0

Note.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	9 48 28.39	+9.809	+14 46 6.6	−60.24	3 11.5
2	9 52 22.71	9.717	14 21 53.4	60.86	3 11.5
3	9 56 14.82	9.625	13 57 25.6	61.45	3 11.4
4	10 0 4.71	9.532	13 32 44.0	62.01	3 11.3
5	10 3 52.37	9.439	13 7 49.3	62.54	3 11.1
6	10 7 37.78	+9.345	+12 42 42.3	−63.04	3 10.9
7	10 11 20.95	9.251	12 17 23.8	63.51	3 10.7
8	10 15 1.85	9.157	11 51 54.5	63.94	3 10.5
9	10 18 40.49	9.062	11 26 15.2	64.34	3 10.2
10	10 22 16.84	8.967	11 0 26.6	64.71	3 9.9
11	10 25 50.89	+8.870	+10 34 29.5	−65.05	3 9.6
12	10 29 22.61	8.773	10 8 24.6	65.36	3 9.2
13	10 32 52.00	8.675	9 42 12.6	65.63	3 8.7
14	10 36 19.04	8.577	9 15 54.3	65.88	3 8.2
15	10 39 43.71	8.478	8 49 30.5	66.10	3 7.6
16	10 43 5.97	+8.377	+ 8 23 2.0	−66.28	3 7.0
17	10 46 25.81	8.275	7 56 29.4	66.43	3 6.4
18	10 49 43.18	8.172	7 29 53.5	66 55	3 5.7
19	10 52 58.06	8.067	7 3 15.2	66.64	3 5.0
20	10 56 10.39	7.960	6 36 35.3	66.69	3 4.3
21	10 59 20.13	+7.851	+ 6 9 54.5	−66.71	3 3.5
22	11 2 27.25	7.740	5 43 13.7	66.69	3 2.7
23	11 5 31.67	7.627	5 16 33.8	66.64	3 1.8
24	11 8 33.35	7.511	4 49 55.6	66.55	3 0.9
25	11 11 32.20	7.392	4 23 19.9	66.42	2 59.9
26	11 14 28.16	+7.271	+ 3 56 47.7	−66.26	2 58.9
27	11 17 21.18	7.147	3 30 19.9	66.06	2 57.8
28	11 20 11.18	7.019	3 3 57.4	65.82	2 56.7
29	11 22 58.07	6.888	2 37 41.0	65.54	2 55.5
30	11 25 41.77	6.753	2 11 31.8	65.22	2 54.3
31	11 28 22.19	+6.615	+ 1 45 30.7	−64.86	2 53.0
32	11 30 59.23	+6.472	+ 1 19 38.8	−64.46	2 51.7

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	11.″2	11.″8	12.″5	13.″3	14.″1	15.″1
Hor. Parallax . .	11.6	12.2	12.9	13.7	14.6	15.7

AUGUST.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	11 30 59.23	+6.472	+1 19 38.8	−64.46	2 51.7
2	11 33 32.79	6.325	0 53 57.1	64.01	2 50.3
3	11 36 2.77	6.174	0 28 26.6	63.52	2 48.8
4	11 38 29.09	6.019	+0 3 8.3	62.99	2 47.3
5	11 40 51.63	5.859	−0 21 56.8	62.41	2 45.7
6	11 43 10.28	+5.694	−0 46 47.4	−61.79	2 44.1
7	11 45 24.91	5.524	1 11 22.5	61.12	2 42.4
8	11 47 35.41	5.349	1 35 40.9	60.40	2 40.7
9	11 49 41.64	5.168	1 59 41.5	59.63	2 38.9
10	11 51 43.46	4.982	2 23 22.8	58.81	2 37.0
11	11 53 40.72	+4.789	−2 46 43.7	−57.93	2 35.0
12	11 55 33.28	4.590	3 9 42.8	57.00	2 32.9
13	11 57 20.98	4.384	3 32 18.8	56.00	2 30.7
14	11 59 3.66	4.172	3 54 30.3	54.95	2 28.4
15	12 0 41.16	3.952	4 16 15.7	53.82	2 26.1
16	12 2 13.28	+3.724	−4 37 33.2	−52.63	2 23.7
17	12 3 39.84	3.488	4 58 21.2	51.36	2 21.2
18	12 5 0.62	3.243	5 18 37.9	50.02	2 18.6
19	12 6 15.43	2.990	5 38 21.6	48.60	2 15.9
20	12 7 24.06	2.729	5 57 30.3	47.10	2 13.1
21	12 8 26.31	+2.458	−6 16 1.8	−45.51	2 10.2
22	12 9 21.96	2.178	6 33 54.1	43.83	2 7.2
23	12 10 10.78	1.889	6 51 4.8	42.05	2 4.1
24	12 10 52.57	1.592	7 7 31.5	40.17	2 0.8
25	12 11 27.12	1.286	7 23 11.8	38.18	1 57.4
26	12 11 54.23	+0.972	−7 38 3.2	−36.09	1 53.9
27	12 12 13.72	0.650	7 52 3.1	33.89	1 50.3
28	12 12 25.41	+0.321	8 5 8.9	31.57	1 46.6
29	12 12 29.13	−0.013	8 17 17.7	29.14	1 42.7
30	12 12 24.76	0.353	8 28 26.8	26.59	1 38.7
31	12 12 12.17	−0.697	−8 38 33.3	−23.93	1 34.5
32	12 11 51.27	−1.045	−8 47 34.4	−21.15	1 30.2

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .	16.″3	17.″5	18.″9	20.″5	22.″2	24.″1
Hor. Parallax . .	16.8	18.1	19.6	21.2	23.0	24.9

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	12 11 51.27	−1.045	−8 47 34.4	−21.15	1 30.2
2	12 11 22.00	1.394	8 55 27.3	18.25	1 25.8
3	12 10 44.38	1.742	9 2 9.4	15.24	1 21.2
4	12 9 58.42	2.088	9 7 38.1	12.13	1 16.5
5	12 9 4.20	2.430	9 11 51.0	8.92	1 11.7
6	12 8 1.85	−2.765	−9 14 45.7	− 5.62	1 6.8
7	12 6 51.55	3.091	9 16 20.2	− 2.24	1 1.7
8	12 5 33.54	3.407	9 16 32.8	+ 1.20	0 56.5
9	12 4 8.13	3.709	9 15 22.1	4.69	0 51.1
10	12 2 35.66	3 995	9 12 47.1	8.23	0 45.6
11	12 0 56.52	−4.263	−9 8 46.9	+11.78	0 40.0
12	11 59 11.19	4.510	9 3 21.5	15.33	0 34.3
13	11 57 20.22	4.734	8 56 31.3	18.84	0 28.5
14	11 55 24.19	4.931	8 48 17.4	22.30	0 22.7
15	11 53 23.75	5.100	8 38 41.4	25.68	0 16.8
16	11 51 19.63	−5.239	−8 27 45.6	+28.95	0 10.8
17	11 49 12.54	5.346	8 15 32.7	32.09	0 4.8 23 58.7
18	11 47 3.26	5.422	8 2 6.3	35.08	23 52.6
19	11 44 52.60	5.462	7 47 30.5	37.88	23 46.5
20	11 42 41.40	5.466	7 31 50.0	40.46	23 40.4
21	11 40 30.50	−5.435	−7 15 10.3	+42.81	23 34.3
22	11 38 20.75	5.370	6 57 37.2	44.90	23 28.2
23	11 36 13.01	5.270	6 39 17.1	46.72	23 22.2
24	11 34 8.12	5.134	6 20 16.9	48.25	23 16.2
25	11 32 6.88	4.964	6 0 43.4	49.48	23 10.3
26	11 30 10.09	−4.763	−5 40 44.1	+50.41	23 4.6
27	11 28 18.47	4.532	5 20 26.1	51.04	22 59.0
28	11 26 32.70	4.275	4 59 56.9	51.35	22 53.5
29	11 24 53.42	3.993	4 39 23.6	51.38	22 48.0
30	11 23 21.18	3.689	4 18 53.3	51.11	22 42.6
31	11 21 56.48	−3.365	−3 58 32.7	+50.56	22 37.4
32	11 20 39.76	−3.025	−3 38 28.4	+49.75	22 32.3

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″
Semidiameter . .	25.9	27.7	29.2	30.1	30.4	29.8
Hor. Parallax . .	26.9	28.7	30.2	31.2	31.5	30.9

OCTOBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	11 21 56.48	−3.365	−3 58 32.7	+50.56	22 37.4
2	11 20 39.76	3.025	3 38 28.4	49.75	22 32.3
3	11 19 31.43	2.670	3 18 46.6	48.70	22 27.5
4	11 18 31.76	2.302	2 59 32.9	47.42	22 22.6
5	11 17 40.99	1.927	2 40 52.1	45.95	22 18.0
6	11 16 59.29	−1.546	−2 22 48.9	+44.29	22 13.5
7	11 16 26.79	1.162	2 5 27.5	42.46	22 9.2
8	11 16 3.53	0.777	1 48 51.6	40.50	22 5.0
9	11 15 49.49	0.393	1 33 4.2	38.42	22 1.0
10	11 15 44.63	−0.012	1 18 8.0	36.24	21 57.1
11	11 15 48.89	+0.366	−1 4 5.1	+33.98	21 53.4
12	11 16 2.14	0.738	0 50 57.3	31.66	21 49.8
13	11 16 24.24	1.103	0 38 45.9	29.29	21 46.4
14	11 16 55.00	1.460	0 27 31.9	26.88	21 43.2
15	11 17 34.23	1.809	0 17 16.1	24.44	21 40.0
16	11 18 21.72	+2.148	−0 7 58.7	+22.00	21 36.9
17	11 19 17.24	2 477	+0 0 20.0	19.56	21 34.0
18	11 20 20.55	2.797	0 7 40.0	17.12	21 31.2
19	11 21 31.43	3.107	0 14 1.6	14.69	21 28.5
20	11 22 49.64	3.407	0 19 25.5	12.29	21 26.0
21	11 24 14.93	+3.697	+0 23 52.0	+ 9.91	21 23.6
22	11 25 47.05	3.977	0 27 21.6	7.56	21 21.3
23	11 27 25.78	4.247	0 29 55.2	5.24	21 19.1
24	11 29 10.89	4.508	0 31 33.6	2.97	21 17.0
25	11 31 2.13	4.759	0 32 17.9	+ 0.73	21 15.0
26	11 32 59.29	+5.002	+0 32 9.0	− 1.46	21 13.1
27	11 35 2.16	5.235	0 31 7.9	3.62	21 11.3
28	11 37 10.52	5.460	0 29 15.7	5.73	21 9.6
29	11 39 24.15	5.676	0 26 33.2	7.80	21 8.0
30	11 41 42.85	5.883	0 23 1.7	9.82	21 6.4
31	11 44 6.44	+6.082	+0 18 42.4	−11.78	21 4.9
32	11 46 34.74	+6.274	+0 13 36.4	−13.70	21 3.4

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″
Semidiameter . .	28.7	27.0	25.2	23.4	21.6	20.0
Hor. Parallax . .	29.7	28.0	26.1	24.2	22.4	20.7

NOTE—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	11 46 34.74	+6.274	+0 13 36.4	−13.70	21 3.4
2	11 49 7.55	6.459	0 7 45.0	15.57	21 2.1
3	11 51 44.71	6.636	+0 1 9.3	17.39	21 0.9
4	11 54 26.03	6.806	−0 6 9.5	19.16	20 59.7
5	11 57 11.35	6.969	0 14 10.1	20.88	20 58.6
6	12 0 0.52	+7.126	−0 22 51.2	−22.54	20 57.5
7	12 2 53.37	7.276	0 32 11.6	24.15	20 56.5
8	12 5 49.73	7.420	0 42 10.1	25.71	20 55.5
9	12 8 49.47	7.558	0 52 45.3	27.22	20 54.6
10	12 11 52.46	7.691	1 3 56.1	28.68	20 53.8
11	12 14 58.57	+7.818	−1 15 41.2	−30.08	20 53.0
12	12 18 7.66	7.941	1 27 59.3	31.43	20 52.3
13	12 21 19.63	8.058	1 40 49.0	32.72	20 51.6
14	12 24 34.35	8.170	1 54 9.3	33.96	20 50.9
15	12 27 51.73	8.278	2 7 58.9	35.16	20 50.3
16	12 31 11.68	+8.383	−2 22 16.6	−36.30	20 49.7
17	12 34 34.10	8.485	2 37 1.2	37.40	20 49.2
18	12 37 58.90	8.582	2 52 11.6	38.45	20 48.7
19	12 41 26.00	8.676	3 7 46.6	39.45	20 48.2
20	12 44 55.34	8.768	3 23 45.0	40.41	20 47.8
21	12 48 26.86	+8.858	−3 40 5.8	−41.32	20 47.4
22	12 52 0.50	8.945	3 56 47.9	42.18	20 47.1
23	12 55 36.20	9.029	4 13 50.2	43.00	20 46.8
24	12 59 13.89	9.111	4 31 11.6	43.78	20 46.5
25	13 2 53.54	9.192	4 48 51.1	44.51	20 46.3
26	13 6 35.11	+9.271	−5 6 47.6	−45.20	20 46.1
27	13 10 18.58	9.349	5 25 0.1	45.84	20 45.9
28	13 14 3.89	9.425	5 43 27.5	46.44	20 45.7
29	13 17 51.02	9.501	6 2 9.0	47.00	20 45.6
30	13 21 39.94	9.575	6 21 3.3	47.52	20 45.5
31	13 25 30.62	+9.648	−6 40 9.6	−47.99	20 45.4
32	13 29 23.05	+9.720	−6 59 26.7	−48.42	20 45.3

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter . .	18.5	17.2	16.1	15.0	14.1	13.3
Hor. Parallax . .	19.2	17.8	16.6	15.6	14.6	13.7

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	13 25 30.62	+ 9.648	−6 40 9.6	−47.99	20 45.4
2	13 29 23.05	9.720	6 59 26.7	48.42	20 45.3
3	13 33 17.19	9.791	7 18 53.7	48.82	20 45.3
4	13 37 13.02	9.861	7 38 29.6	49.17	20 45.4
5	13 41 10.52	9.930	7 58 13.4	49.48	20 45.4
6	13 45 9.66	+ 9.998	−8 18 4.1	−49.74	20 45.5
7	13 49 10.44	10.066	8 38 0.5	49.96	20 45.6
8	13 53 12.81	10.132	8 58 1.8	50.14	20 45.7
9	13 57 16.77	10.198	9 18 6.9	50.28	20 45.8
10	14 1 22.30	10.263	9 38 14.7	50.37	20 45.9
11	14 5 29.39	+10.328	− 9 58 24.3	−50.42	20 46.1
12	14 9 38.03	10.392	10 18 34.7	50.43	20 46.3
13	14 13 48.20	10.455	10 38 44.9	50.40	20 46.6
14	14 17 59.88	10.518	10 58 53.8	50.33	20 46.9
15	14 22 13.08	10.581	11 19 0.5	50.22	20 47.2
16	14 26 27.77	+10.644	−11 39 4.0	−50.07	20 47.5
17	14 30 43.96	10 706	11 59 3.4	49.88	20 47.9
18	14 35 1.64	10.768	12 18 57.7	49.65	20 48.3
19	14 39 20.79	10.829	12 38 46.0	49.38	20 48.7
20	14 43 41.41	10.891	12 58 27.3	49.07	20 49.1
21	14 48 3.51	+10.952	−13 18 0.7	−48.72	20 49.5
22	14 52 27.08	11.014	13 37 25.3	48.33	20 50.0
23	14 56 52 13	11.075	13 56 40.1	47.90	20 50.5
24	15 1 18.66	11.137	14 15 44.3	47.44	20 51.0
25	15 5 46.67	11.198	14 34 37.0	46.94	20 51.5
26	15 10 16.15	+11.259	−14 53 17.3	−46.41	20 52.1
27	15 14 47.10	11.320	15 11 44.3	45.84	20 52.7
28	15 19 19.53	11.381	15 29 57.1	45.23	20 53.3
29	15 23 53.42	11.442	15 47 54.9	44.59	20 54.0
30	15 28 28.78	11.503	16 5 36.8	43.91	20 54.7
31	15 33 5.59	+11.564	−16 23 2.0	−43.19	20 55.4
32	15 37 43.87	+11.625	−16 40 9.5	−42.44	20 56.1

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
	″	″	″	″	″	″	″
Semidiameter . .	12.5	11.9	11.3	10.8	10.3	9.8	9.4
Hor. Parallax . .	13.0	12.3	11.7	11.1	10.6	10.2	9.8

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	20 36 20.86	+8.090	−19 48 13.2	+30.05	1 53.0
2	20 39 34.80	8.072	19 36 5.9	30.57	1 52.3
3	20 42 48.33	8.055	19 23 45.7	31.10	1 51.6
4	20 46 1.43	8.037	19 11 12.9	31.63	1 50.8
5	20 49 14.09	8.019	18 58 27.6	32.14	1 50.1
6	20 52 26.31	+8.000	−18 45 30.0	+32.65	1 49.4
7	20 55 38.10	7.982	18 32 20.2	33.15	1 48.6
8	20 58 49.45	7.964	18 18 58.6	33.65	1 47.9
9	21 2 0.36	7.945	18 5 25.2	34.13	1 47.1
10	21 5 10.81	7.926	17 51 40.3	34.61	1 46.4
11	21 8 20.82	+7.908	−17 37 44.0	+35.08	1 45.6
12	21 11 30.39	7.889	17 23 36.5	35.54	1 44.8
13	21 14 39.51	7.870	17 9 18.0	35.99	1 44.0
14	21 17 48.18	7.852	16 54 48.8	36.44	1 43.2
15	21 20 56.41	7.834	16 40 9.0	36.88	1 42.4
16	21 24 4.20	+7.815	−16 25 18.7	+37 31	1 41.6
17	21 27 11.54	7.797	16 10 18.3	37.72	1 40.7
18	21 30 18.44	7.778	15 55 7.9	38.14	1 39.9
19	21 33 24.90	7.760	15 39 47.7	38.54	1 39.1
20	21 36 30.92	7.742	15 24 17.9	38.94	1 38.3
21	21 39 36.50	+7.723	−15 8 38.8	+39.32	1 37.4
22	21 42 41.63	7.705	14 52 50.4	39.70	1 36.5
23	21 45 46.33	7.687	14 36 53.2	40.06	1 35.7
24	21 48 50.59	7.668	14 20 47.2	40.43	1 34.8
25	21 51 54.41	7.650	14 4 32.7	40.78	1 33.9
26	21 54 57.79	+7.632	−13 48 9.9	+41.12	1 33.0
27	21 58 0.74	7.613	13 31 39.0	41.45	1 32 1
28	22 1 3.25	7.595	13 15 0.3	41.77	1 31.2
29	22 4 5.32	7.577	12 58 14.0	42.08	1 30.3
30	22 7 6.96	7.559	12 41 20.2	42.39	1 29.4
31	22 10 8.17	+7.542	−12 24 19.3	+42.68	1 28.5
32	22 13 8.96	+7.524	−12 7 11.4	+42.97	1 27.5

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	2″.3	2″.3	2″.3	2″.3	2″.2	2″.2	2″.2
Hor. Parallax . .	4.0	4.0	4.0	3.9	3.9	3.9	3.9

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	22 13 8.96	+7.524	−12 7 11.4	+42.97	1 27.5
2	22 16 9.33	7.507	11 49 56.7	43.25	1 26.6
3	22 19 9.29	7.491	11 32 35.5	43.52	1 25.7
4	22 22 8.84	7.473	11 15 7.9	43.78	1 24.8
5	22 25 7.98	7.456	10 57 34.1	44.03	1 23.8
6	22 28 6.72	+7.439	−10 39 54.5	+44.27	1 22.8
7	22 31 5.07	7.423	10 22 9.1	44.50	1 21.8
8	22 34 3.03	7.407	10 4 18.3	44.73	1 20.9
9	22 37 0.63	7.392	9 46 22.1	44.95	1 19.9
10	22 39 57.85	7.377	9 28 20.8	45.15	1 18.9
11	22 42 54.72	+7.362	− 9 10 14.6	+45.35	1 17.9
12	22 45 51.23	7.347	8 52 3.8	45.55	1 16.9
13	22 48 47.40	7.333	8 33 48.5	45.73	1 15.9
14	22 51 43.23	7.320	8 15 28.8	45.90	1 14.9
15	22 54 38.74	7.306	7 57 5.0	46.07	1 13.9
16	22 57 33.93	+7.293	− 7 38 37.4	+46.23	1 12.9
17	23 0 28.81	7.280	7 20 6.0	46.38	1 11.8
18	23 3 23.39	7.268	7 1 31.2	46.52	1 10.8
19	23 6 17.67	7.255	6 42 53.1	46.65	1 9.8
20	23 9 11.65	7.243	6 24 12.0	46.77	1 8.7
21	23 12 5.35	+7.232	− 6 5 28.0	+46.89	1 7.7
22	23 14 58.77	7.220	5 46 41.4	46.99	1 6.6
23	23 17 51.92	7.209	5 27 52.3	47.09	1 5.6
24	23 20 44.80	7.198	5 9 1.0	47.18	1 4.5
25	23 23 37.42	7.187	4 50 7.7	47.26	1 3.4
26	23 26 29.80	+7.177	− 4 31 12.6	+47.33	1 2.4
27	23 29 21.92	7.167	4 12 15.8	47.39	1 1.3
28	23 32 13.80	7.157	3 53 17.7	47.45	1 0.2
29	23 35 5.45	7.147	3 34 18.4	47.49	0 59.2
30	23 37 56.87	7.138	3 15 18.1	47.53	0 58.1
31	23 40 48.07	+7.129	− 2 56 17.0	+47.56	0 57.0
32	23 43 39.07	+7.121	− 2 37 15.2	+47.58	0 55.9

Day of the Month.	5th.	10th.	15th.	20th.	25th.
Semidiameter.	2″.2	2″.2	2″.2	2″.2	2″.2
Horizontal Parallax . .	3.9	3.8	3.8	3.8	3.8

Note.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 35 5.45	+7.147	−3 34 18.4	+47.49	0 59.2
2	23 37 56.87	7.138	3 15 18.1	47.53	0 58.1
3	23 40 48.07	7.129	2 56 17.0	47.56	0 57.0
4	23 43 39.07	7.121	2 37 15.2	47.58	0 55.9
5	23 46 29.86	7.112	2 18 13.1	47.59	0 54.8
6	23 49 20.46	+7.104	−1 59 10.8	+47.60	0 53.7
7	23 52 10.87	7.097	1 40 8.4	47.60	0 52.6
8	23 55 1.11	7.090	1 21 6.1	47.59	0 51.5
9	23 57 51.19	7.083	1 2 4.2	47.57	0 50.4
10	0 0 41.12	7.077	0 43 2.8	47.54	0 49.3
11	0 3 30.90	+7.072	−0 24 2.1	+47.51	0 48.1
12	0 6 20.55	7.066	−0 5 2.2	47.47	0 47.0
13	0 9 10.08	7.061	+0 13 56.7	47.43	0 45.9
14	0 11 59.49	7.057	0 32 54.3	47.37	0 44.8
15	0 14 48.80	7.053	0 51 50.5	47.31	0 43.7
16	0 17 38.01	+7.049	+1 10 45.2	+47.24	0 42.6
17	0 20 27.14	7.045	1 29 38.2	47.17	0 41.4
18	0 23 16.19	7.042	1 48 29.2	47.08	0 40.3
19	0 26 5.16	7.039	2 7 18.1	46.99	0 39.2
20	0 28 54.08	7.037	2 26 4.8	46.89	0 38.1
21	0 31 42.94	+7.035	+2 44 49.0	+46.79	0 36.9
22	0 34 31.75	7.033	3 3 30.6	46.67	0 35.8
23	0 37 20.52	7.031	3 22 9.3	46.55	0 34.7
24	0 40 9.25	7.030	3 40 45.1	46.43	0 33.6
25	0 42 57.96	7.029	3 59 17.8	46.29	0 32.4
26	0 45 46.64	+7.028	+4 17 47.0	+46.15	0 31.3
27	0 48 35.30	7.027	4 36 12.8	46.00	0 30.2
28	0 51 23.95	7.027	4 54 34.8	45.84	0 29.0
29	0 54 12.60	7.027	5 12 53.0	45.67	0 27.9
30	0 57 1.25	7.027	5 31 7.1	45.50	0 26.8
31	0 59 49.90	+7.027	+5 49 17.0	+45.32	0 25.6
32	1 2 38.57	+7.028	+6 7 22.5	+45.14	0 24.5

APRIL.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	1 2 38.57	+7.028	+ 6 7 22.5	+45.14	0 24.5
2	1 5 27.26	7.029	6 25 23.5	44.94	0 23.4
3	1 8 15.97	7.031	6 43 19.8	44.74	0 22.2
4	1 11 4.72	7.032	7 1 11.2	44.53	0 21.1
5	1 13 53.52	7.034	7 18 57.6	44.32	0 20.0
6	1 16 42.37	+7.037	+ 7 36 38.8	+44.11	0 18.9
7	1 19 31.28	7.039	7 54 14.6	43.89	0 17.7
8	1 22 20.25	7.042	8 11 45.0	43.65	0 16.6
9	1 25 9.30	7.045	8 29 9.8	43.41	0 15.5
10	1 27 58.43	7.049	8 46 28.8	43.17	0 14.4
11	1 30 47.65	+7.053	+ 9 3 41.8	+42.92	0 13.2
12	1 33 36.97	7.057	9 20 48.8	42.66	0 12.1
13	1 36 26.39	7.062	9 37 49.6	42 40	0 11.0
14	1 39 15.93	7.067	9 54 44.1	42.13	0 9.9
15	1 42 5.59	7.072	10 11 32.1	41.86	0 8.8
16	1 44 55.37	+7.077	+10 28 13.4	+41.58	0 7.7
17	1 47 45.28	7.082	10 44 48.0	41 30	0 6.6
18	1 50 35.32	7.088	11 1 15.6	41.00	0 5.5
19	1 53 25.49	7.094	11 17 36.2	40.70	0 4.3
20	1 56 15.80	7.100	11 33 49.5	40.40	0 3.2
21	1 59 6.26	+7.106	+11 49 55.5	+40.09	0 2.1
22	2 1 56.87	7.112	12 5 53.9	39.78	0 1.0 23 59.9
23	2 4 47.62	7.118	12 21 44.7	39.45	23 58.9
24	2 7 38.52	7.124	12 37 27.7	39.13	23 57.8
25	2 10 29.58	7.131	12 53 2.8	38.79	23 56.7
26	2 13 20.79	+7.137	+13 8 29.8	+38.45	23 55.6
27	2 16 12.16	7.144	13 23 48.5	38.11	23 54.5
28	2 19 3.68	7.150	13 38 58.8	37.75	23 53.4
29	2 21 55.37	7.157	13 54 0.7	37.40	23 52.3
30	2 24 47.23	7.164	14 8 53.9	37.03	23 51.3
31	2 27 39.25	+7.171	+14 23 38.3	+36.67	23 50.2
32	2 30 31.43	+7.178	+14 38 13.9	+36.29	23 49.1

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . . .	2″.2	2″.1	2″.1	2″.1	2″.1	2″.1
Horizontal Parallax	3.8	3.7	3.7	3.7	3.7	3.7

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter . .	2″.1	2″.1	2″.1	2″.1	2″.1	2″.1
Hor. Parallax . .	3.7	3.7	3.6	3.6	3.6	3.6

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	2 27 39.25	+7.171	+14 23 38.3	+36.67	23 50.2
2	2 30 31.43	7.178	14 38 13.9	36.29	23 49.1
3	2 33 23.79	7.185	14 52 40.5	35.92	23 48.1
4	2 36 16.32	7.192	15 6 57.9	35.53	23 47.0
5	2 39 9.03	7.200	15 21 6.0	35.14	23 45.9
6	2 42 1.92	+7.208	+15 35 4.8	+34.75	23 44.9
7	2 44 54.99	7.215	15 48 54.0	34.35	23 43.8
8	2 47 48.25	7.223	16 2 33.7	33.95	23 42.8
9	2 50 41.70	7.231	16 16 3.7	33.54	23 41.7
10	2 53 35.34	7.239	16 29 23.9	33.13	23 40.7
11	2 56 29.17	+7.247	+16 42 34.1	+32.72	23 39.7
12	2 59 23.20	7.255	16 55 34.3	32.30	23 38.6
13	3 2 17.42	7.263	17 8 24.4	31.87	23 37.6
14	3 5 11.84	7.272	17 21 4.2	31.44	23 36.5
15	3 8 6.46	7.280	17 33 33.8	31.01	23 35.5
16	3 11 1.27	+7.288	+17 45 52.8	+30.58	23 34.5
17	3 13 56.27	7.296	17 58 1.4	30.13	23 33.5
18	3 16 51.47	7.304	18 9 59.3	29.69	23 32.5
19	3 19 46.85	7.312	18 21 46.4	29.24	23 31.4
20	3 22 42.42	7.319	18 33 22.7	28.78	23 30.4
21	3 25 38.18	+7.327	+18 44 48.0	+28.33	23 29.4
22	3 28 34.11	7.334	18 56 2.3	27.86	23 28.4
23	3 31 30.21	7.341	19 7 5.4	27.40	23 27.4
24	3 34 26.49	7.348	19 17 57.3	26.92	23 26.4
25	3 37 22.93	7.355	19 28 37.9	26.45	23 25.4
26	3 40 19.53	+7.362	+19 39 7.1	+25.97	23 24.4
27	3 43 16.28	7.368	19 49 24.7	25.49	23 23.4
28	3 46 13.19	7.374	19 59 30.7	25.01	23 22.4
29	3 49 10.24	7.380	20 9 25.0	24.52	23 21.4
30	3 52 7.44	7 386	20 19 7.6	24.03	23 20.5
31	3 55 4.78	+7.392	+20 28 38.3	+23.53	23 19.5
32	3 58 2.26	+7.398	+20 37 57.1	+23.03	23 18.5

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	2″.1	2″.1	2″.0	2″.0	2″.0	2″.0	2″.0
Hor. Parallax . .	3.6	3.6	3.6	3.6	3.6	3.6	3.6

JUNE.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	3 58 2.26	+7.398	+20 37 57.1	+23.03	23 18.5
2	4 0 59.87	7.403	20 47 3.9	22.53	23 17.5
3	4 3 57.61	7.408	20 55 58.7	22.03	23 16.5
4	4 6 55.47	7.413	21 4 41.4	21.53	23 15.5
5	4 9 53.45	7.418	21 13 12.0	21.02	23 14.6
6	4 12 51.54	+7.423	+21 21 30.3	+20.51	23 13.6
7	4 15 49.76	7.428	21 29 36.4	20.00	23 12.6
8	4 18 48.08	7.432	21 37 30.2	19.48	23 11.6
9	4 21 46.51	7.437	21 45 11.6	18.97	23 10.7
10	4 24 45.04	7.441	21 52 40.6	18.45	23 9.7
11	4 27 43.66	+7.445	+21 59 57.1	+17.93	23 8.8
12	4 30 42.38	7.448	22 7 1.2	17.41	23 7.8
13	4 33 41.17	7.451	22 13 52.7	16.89	23 6 8
14	4 36 40.04	7.454	22 20 31.7	16.36	23 5.9
15	4 39 38.98	7.457	22 26 58.1	15.84	23 4.9
16	4 42 37.97	+7.459	+22 33 11.8	+15.31	23 4.0
17	4 45 37.02	7.461	22 39 12.9	14.78	23 3.0
18	4 48 36.11	7.463	22 45 1.2	14.25	23 2.1
19	4 51 35.24	7.464	22 50 36.8	13.73	23 1.1
20	4 54 34.38	7.464	22 55 59.7	13.19	23 0.1
21	4 57 33.53	+7.465	+23 1 9.7	+12.65	22 59.2
22	5 0 32.68	7.465	23 6 7.0	12.12	22 58.2
23	5 3 31.83	7.464	23 10 51.4	11.58	22 57.3
24	5 6 30.95	7.463	23 15 22.9	11.05	22 56.3
25	5 9 30.04	7.462	23 19 41.6	10.51	22 55.3
26	5 12 29.10	+7.460	+23 23 47.5	+ 9.97	22 54.4
27	5 15 28.11	7.458	23 27 40.5	9.44	22 53.4
28	5 18 27.07	7.455	23 31 20.6	8.90	22 52.5
29	5 21 25.97	7.453	23 34 47.9	8.37	22 51.5
30	5 24 24.79	7.449	23 38 2.2	7.83	22 50.5
31	5 27 23.53	+7.446	+23 41 3.8	+ 7.30	22 49.6
32	5 30 22.18	+7.442	+23 43 52.5	+ 6.76	22 48.6

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	2″.0	2″.0	2″.0	2″.0	2″.0	2″.0
Hor. Parallax . .	3.6	3.6	3.6	3.6	3.6	3.6

Note.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	5 27 23.53	+7.446	+23 41 3.8	+7.30	22 49.6	1	6 58 19.33	+7.160	+23 31 27.2	− 8.51	22 18.2
2	5 30 22.18	7.442	23 43 52.5	6.76	22 48.6	2	7 1 11.01	7.145	23 27 57.6	8.97	22 17.1
3	5 33 20.74	7.438	23 46 28.3	6.23	22 47.6	3	7 4 2.32	7.131	23 24 16.8	9.43	22 16.0
4	5 36 19.19	7.433	23 48 51.3	5.69	27 46.7	4	7 6 53.28	7.116	23 20 25.0	9.89	22 14.9
5	5 39 17.53	7.428	23 51 1.5	5.16	22 45.7	5	7 9 43.89	7.101	23 16 22.2	10.34	22 13.8
6	5 42 15.76	+7.423	+23 52 59.0	+4.63	22 44.7	6	7 12 34.12	+7.085	+23 12 8.5	−10.79	22 12.7
7	5 45 13.86	7.418	23 54 43.8	4.10	22 43.8	7	7 15 23.99	7.070	23 7 44.0	11.24	22 11.6
8	5 48 11.82	7.412	23 56 15.8	3.57	22 42.8	8	7 18 13.48	7.054	23 3 8.9	11.69	22 10.5
9	5 51 9.64	7.406	23 57 35.2	3.04	22 41.8	9	7 21 2.59	7.038	22 58 23.1	12.13	22 9.3
10	5 54 7.32	7.400	23 58 41.9	2.52	22 40.8	10	7 23 51.31	7.022	22 53 26.9	12.57	22 8.2
11	5 57 4.85	+7.393	+23 59 36.0	+1.99	22 39.8	11	7 26 39.65	+7.006	+22 48 20.2	−12.99	22 7.1
12	6 0 2.21	7.386	24 0 17.5	1.47	22 38.8	12	7 29 27.59	6.989	22 43 3.2	13.42	22 5.9
13	6 2 59.38	7.379	24 0 46.4	0.95	22 37.8	13	7 32 15.12	6.972	22 37 36.0	13.84	22 4.7
14	6 5 56.38	7.371	24 1 2.9	+0.43	22 36.8	14	7 35 2.24	6.955	22 31 58.7	14.26	22 3.6
15	6 8 53.18	7.362	24 1 7.0	−0.09	22 35.8	15	7 37 48.95	6.937	22 26 11.5	14.67	22 2.4
16	6 11 49.77	+7.354	+24 0 58.7	−0.60	22 34.8	16	7 40 35.23	+6.919	+22 20 14.3	−15.09	22 1.2
17	6 14 46.15	7.345	24 0 38.0	1.12	22 33.8	17	7 43 21.08	6.901	22 14 7.4	15.49	22 0.1
18	6 17 42.30	7.335	24 0 5.0	1.63	22 32.8	18	7 46 6.50	6.883	22 7 50.8	15.89	21 58.9
19	6 20 38.22	7.325	23 59 19.8	2.14	22 31.8	19	7 48 51.49	6.865	22 1 24.6	16.29	21 57.7
20	6 23 33.90	7.314	23 58 22.4	2.64	22 30.8	20	7 51 36.03	6.846	21 54 49.1	16.68	21 56.5
21	6 26 29.31	+7.303	+23 57 12.9	−3.15	22 29.8	21	7 54 20.12	+6.827	+21 48 4.2	−17.06	21 55.2
22	6 29 24.46	7.292	23 55 51.3	3.65	22 28.7	22	7 57 3.75	6.808	21 41 10.1	17.44	21 54.0
23	6 32 19.33	7.280	23 54 17.7	4.15	22 27.7	23	7 59 46.92	6.789	21 34 6.8	17.82	21 52.8
24	6 35 13.91	7.268	23 52 32.2	4.64	22 26.7	24	8 2 29.63	6.770	21 26 54.6	18.19	21 51.6
25	6 38 8.20	7.256	23 50 34.8	5.14	22 25.6	25	8 5 11.88	6.751	21 19 33.5	18.56	21 50.3
26	6 41 2.19	+7.243	+23 48 25.6	−5.63	22 24.6	26	8 7 53.65	+6.731	+21 12 3.6	−18.93	21 49.1
27	6 43 55.86	7.230	23 46 4.7	6.11	22 23.5	27	8 10 34.96	6.712	21 4 25.1	19.28	21 47.8
28	6 46 49.21	7.216	23 43 32.2	6.60	22 22.5	28	8 13 15.81	6.692	20 56 38.1	19.63	21 46.5
29	6 49 42.24	7.203	23 40 48.1	7.08	22 21.4	29	8 15 56.18	6.673	20 48 42.7	19.98	21 45.3
30	6 52 34.94	7.189	23 37 52.5	7.55	22 20.3	30	8 18 36.09	6.653	20 40 39.0	20.33	21 44.0
31	6 55 27.31	+7.175	+23 34 45.5	−8.03	22 19.3	31	8 21 15.53	+6.633	+20 32 27.0	−20.67	21 42.7
32	6 58 19.33	+7.160	+23 31 27.2	−8.51	22 18.2	32	8 23 54.49	+6.614	+20 24 6.9	−21.00	21 41.4

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .	2″.0	2″.1	2″.1	2″.1	2″.1	2″.1	Semidiameter . .	2″.1	2″.1	2″.1	2″.1	2″.2	2″.2
Hor. Parallax . .	3.6	3.6	3.6	3.6	2.6	3.6	Hor. Parallax . .	3.7	3.7	3.7	3.7	3.8	3.8

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	8 23 54.49	+6.614	+20 24 6.9	-21.00	21 41.4	1	9 39 43.65	+6.023	+15 21 30.2	-28.67	20 58.8
2	8 26 32.98	6.594	20 15 39.0	21.33	21 40.1	2	9 42 7.98	6.004	15 10 0.0	28.85	20 57.3
3	8 29 11.01	6.575	20 7 3.2	21.65	21 38.8	3	9 44 31.86	5.986	14 58 25.6	29.02	20 55.7
4	8 31 48.57	6.555	19 58 19.7	21.97	21 37.4	4	9 46 55.29	5.967	14 46 47.1	29.19	20 54.1
5	8 34 25.66	6.536	19 49 28.5	22.27	21 36.1	5	9 49 18.28	5.948	14 35 4.6	29.35	20 52.6
6	8 37 2.28	+6.516	+19 40 29.9	-22.58	21 34.8	6	9 51 40.82	+5.930	+14 23 18.2	-29.51	20 51.0
7	8 39 38.44	6.497	19 31 23.9	22.90	21 33.4	7	9 54 2.92	5.912	14 11 28.1	29.66	20 49.4
8	8 42 14.13	6.477	19 22 10.6	23.20	21 32.1	8	9 56 24.59	5.894	13 59 34.3	29.81	20 47.8
9	8 44 49.35	6.458	19 12 50.2	23.50	21 30.7	9	9 58 45.81	5.875	13 47 37.1	29.96	20 46.2
10	8 47 24.10	6.438	19 3 22.8	23.78	21 29.4	10	10 1 6.60	5.857	13 35 36.4	30.10	20 44.6
11	8 49 58.39	+6.418	+18 53 48.5	-24.07	21 28.0	11	10 3 26.96	+5.839	+13 23 32.5	-30.23	20 43.0
12	8 52 32.19	6.399	18 44 7.5	24.35	21 26.6	12	10 5 46.87	5.821	13 11 25.4	30.36	20 41.4
13	8 55 5.52	6.379	18 34 19.9	24.62	21 25.2	13	10 8 6.35	5.802	12 59 15.3	30.48	20 39.8
14	8 57 38.37	6.359	18 24 25.7	24.89	21 23.8	14	10 10 25.38	5.784	12 47 2.3	30.60	20 38.2
15	9 0 10.74	6.339	18 14 25.1	25.15	21 22.4	15	10 12 43.98	5.766	12 34 46.6	30.71	20 36.5
16	9 2 42.64	+6.319	+18 4 18.3	-25.41	21 21.0	16	10 15 2.14	+5.748	+12 22 28.3	-30.82	20 34.9
17	9 5 14.06	6.299	17 54 5.3	25.66	21 19.5	17	10 17 19.87	5.729	12 10 7.4	30.92	20 33.2
18	9 7 45.00	6.279	17 43 46.4	25.91	21 18.1	18	10 19 37.15	5.711	11 57 44.1	31.02	20 31.6
19	9 10 15.46	6.259	17 33 21.6	26.15	21 16.7	19	10 21 54.00	5.693	11 45 18.6	31.11	20 29.9
20	9 12 45.43	6.239	17 22 51.0	26.39	21 15.2	20	10 24 10.41	5.675	11 32 50.9	31.20	20 28.2
21	9 15 14.92	+6.219	+17 12 14.8	-26.62	21 13.8	21	10 26 26.39	+5.657	+11 20 21.2	-31.28	20 26.6
22	9 17 43.92	6.199	17 1 33.1	26.85	21 12.3	22	10 28 41.94	5.639	11 7 49.5	31.36	20 24.9
23	9 20 12.44	6.179	16 50 46.1	27.07	21 10.8	23	10 30 57.05	5.621	10 55 16.1	31.43	20 23.2
24	9 22 40.49	6.159	16 39 53.8	27.29	21 9.3	24	10 33 11.74	5.603	10 42 40.9	31.50	20 21.5
25	9 25 8.06	6.139	16 28 56.3	27.50	21 7.9	25	10 35 26.00	5.585	10 30 4.2	31.56	20 19.8
26	9 27 35.16	+6.119	+16 17 53.8	-27.71	21 6.4	26	10 37 39.84	+5.568	+10 17 26.1	-31.62	20 18.0
27	9 30 1.79	6.100	16 6 46.4	27.91	21 4.8	27	10 39 53.26	5.551	10 4 46.5	31.67	20 16.3
28	9 32 27.95	6.080	15 55 34.3	28.10	21 3.3	28	10 42 6.27	5.534	9 52 5.7	31.72	20 14.6
29	9 34 53.64	6.061	15 44 17.4	28.30	21 1.8	29	10 44 18.87	5.517	9 39 23.7	31.77	20 12.9
30	9 37 18.87	6.042	15 32 56.0	28.48	21 0.3	30	10 46 31.07	5.500	9 26 40.7	31.81	20 11.1
31	9 39 43.65	+6.023	+15 21 30.2	-28.67	20 58.8	31	10 48 42.86	+5.483	+ 9 13 56.7	-31.85	20 9.4
32	9 42 7.98	+6.004	+15 10 0.0	-28.85	20 57.3	32	10 50 54.24	+5.466	+ 9 1 11.9	-31 88	20 7.6

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.	Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	2″.2	2″.2	2″.2	2″.3	2″.3	2″.3	Semidiameter . .	2″.4	2″.4	2″.4	2″.5	2″.5	2″.6
Hor. Parallax . .	3.8	3.9	3.9	4.0	4.0	4.1	Hor. Parallax . .	4.1	4.2	4.2	4.3	4.4	4.5

NOTE—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	10 50 54.24	+5.466	+9 1 11.9	−31.88	20 7.6
2	10 53 5.22	5.449	8 48 26.4	31.91	20 5.9
3	10 55 15.81	5.433	8 35 40.2	31.94	20 4.1
4	10 57 26.00	5.416	8 22 53.4	31.96	20 2.3
5	10 59 35.79	5.400	8 10 6.3	31.97	20 0.5
6	11 1 45.19	+5.383	+7 57 18.9	−31.98	19 58.7
7	11 3 54.19	5.367	7 44 31.3	31.98	19 56.9
8	11 6 2.79	5.350	7 31 43.6	31.98	19 55.1
9	11 8 10.99	5.333	7 18 56.0	31.98	19 53.3
10	11 10 18.79	5.316	7 6 8.6	31.97	19 51.5
11	11 12 26.18	+5.299	+6 53 21.5	−31.95	19 49.7
12	11 14 33.17	5.282	6 40 34.8	31.93	19 47.9
13	11 16 39.74	5.265	6 27 48.7	31.91	19 46.0
14	11 18 45.90	5.248	6 15 3.2	31.88	19 44.2
15	11 20 51.64	5.231	6 2 18.6	31.85	19 42.3
16	11 22 56.97	+5.213	+5 49 34.9	−31.80	19 40.5
17	11 25 1.88	5.196	5 36 52.1	31.76	19 38.6
18	11 27 6.38	5.178	5 24 10.4	31.71	19 36.7
19	11 29 10.45	5.161	5 11 30.0	31.65	19 34.8
20	11 31 14.10	5.143	4 58 51.0	31.59	19 33.0
21	11 33 17.32	+5.125	+4 46 13.5	−31.53	19 31.1
22	11 35 20.12	5.108	4 33 37.6	31.46	19 29.2
23	11 37 22.50	5.090	4 21 3.3	31.39	19 27.3
24	11 39 24.46	5.073	4 8 30.8	31.32	19 25.4
25	11 41 25.99	5.055	3 56 0.2	31.24	19 23.4
26	11 43 27.10	+5.038	+3 43 31.5	−31.15	19 21.5
27	11 45 27.79	5.020	3 31 4.9	31.06	19 19.6
28	11 47 28.05	5.002	3 18 40.4	30.97	19 17.6
29	11 49 27.89	4.985	3 6 18.2	30.88	19 15.7
30	11 51 27.30	4.967	2 53 58.4	30.78	19 13.7
31	11 53 26.28	+4.949	+2 41 41.0	−30.67	19 11.8
32	11 55 24.84	+4.931	+2 29 26.2	−30.56	19 9.8

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . .	2″.6	2″.7	2″.7	2″.8	2″.9	2″.9
Hor. Parallax . .	4.6	4.7	4.8	4.9	5.0	5.1

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	11 53 26.28	+4.949	+2 41 41.0	−30.67	19 11.8
2	11 55 24.84	4.931	2 29 26.2	30.56	19 9.8
3	11 57 22.95	4.912	2 17 14.0	30.45	19 7.8
4	11 59 20.62	4.894	2 5 4.6	30.33	19 5.8
5	12 1 17.85	4.875	1 52 58.1	30.21	19 3.8
6	12 3 14.63	+4.856	+1 40 54.6	−30.08	19 1.8
7	12 5 10.94	4.837	1 28 54.2	29.95	18 59.8
8	12 7 6.79	4.817	1 16 57.0	29.81	18 57.8
9	12 9 2.16	4.797	1 5 3.2	29.67	18 55.8
10	12 10 57.04	4.777	0 53 12.9	29.52	18 53.8
11	12 12 51.43	+4.756	+0 41 26.3	−29.37	18 51.7
12	12 14 45.32	4.735	0 29 43.3	29.21	18 49.7
13	12 16 38.69	4.713	0 18 4.2	29.05	18 47.6
14	12 18 31.55	4.691	+0 6 29.1	28.88	18 45.6
15	12 20 23.88	4.669	−0 5 1.9	28.71	18 43.5
16	12 22 15.67	+4.646	−0 16 28.7	−28.53	18 41.4
17	12 24 6.91	4.623	0 27 51.2	28.35	18 39.3
18	12 25 57.59	4.600	0 39 9.3	28.16	18 37.2
19	12 27 47.72	4.577	0 50 22.9	27.97	18 35.1
20	12 29 37.28	4.553	1 1 31.9	27.77	18 33.0
21	12 31 26.25	+4.528	−1 12 36.1	−27.58	18 30.8
22	12 33 14.64	4.504	1 23 35.5	27.37	18 28.7
23	12 35 2.44	4.479	1 34 29.9	27.16	18 26.6
24	12 36 49.64	4.454	1 45 19.3	26.95	18 24.4
25	12 38 36.22	4.428	1 56 3.7	26.74	18 22.2
26	12 40 22.19	+4.402	−2 6 42.8	−26.52	18 20.0
27	12 42 7.53	4.376	2 17 16.6	26.30	18 17.8
28	12 43 52.24	4.349	2 27 45.1	26 07	18 15.6
29	12 45 36.29	4.322	2 38 8.1	25.84	18 13.4
30	12 47 19.67	4.294	2 48 25.4	25.60	18 11.2
31	12 49 2.38	+4.265	−2 58 37.1	−25.36	18 9.0
32	12 50 44.39	+4.236	−3 8 42.9	−25.12	18 6.7

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
Semidiameter . .	3″.0	3″.1	3″.2	3″.3	3″.4	3″.5	3″.7
Hor. Parallax . .	5.3	5.4	5.6	5.8	6.0	6.2	6.4

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

Day of Month.	JANUARY. Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	FEBRUARY. Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	14 2 15.41	+1.303	−11 9 3.7	−6.55	19 16.2	1	14 14 2.29	+0.551	−12 4 46.0	−2.29	17 25.8
2	14 2 46.45	1.283	11 11 39.5	6.43	19 12.8	2	14 14 15.18	0.523	12 5 39.1	2.14	17 22.1
3	14 3 17.00	1.263	11 14 12.3	6.30	19 9.3	3	14 14 27.39	0.495	12 6 28.5	1.99	17 18.4
4	14 3 47.06	1.242	11 16 42.0	6.18	19 5.9	4	14 14 38.92	0.466	12 7 14.4	1.83	17 14.6
5	14 4 16.63	1.222	11 19 8.7	6.05	19 2.5	5	14 14 49.75	0.437	12 7 56.6	1.68	17 10.8
6	14 4 45.69	+1.200	−11 21 32.4	−5.93	18 59.0	6	14 14 59.89	+0.408	−12 8 35.2	−1.53	17 7.1
7	14 5 14.24	1.179	11 23 53.1	5.80	18 55.5	7	14 15 9.34	0.379	12 9 10.1	1.38	17 3.3
8	14 5 42.29	1.158	11 26 10.6	5.67	18 52.1	8	14 15 18.08	0.350	12 9 41.4	1.23	16 59.5
9	14 6 9.81	1.136	11 28 25.0	5.54	18 48.6	9	14 15 26.12	0.320	12 10 9.1	1.08	16 55.7
10	14 6 36.80	1.113	11 30 36.4	5.41	18 45.1	10	14 15 33.45	0.291	12 10 33.1	0.93	16 51.9
11	14 7 3.26	+1.091	−11 32 44.6	−5.28	18 41.6	11	14 15 40.07	+0.261	−12 10 53.4	−0.77	16 48.0
12	14 7 29.18	1.068	11 34 49.6	5.14	18 38.1	12	14 15 45.97	0.231	12 11 10.1	0.62	16 44.3
13	14 7 51.54	1.045	11 36 51.4	5.01	18 34.6	13	14 15 51.15	0.201	12 11 23.0	0.47	16 40.3
14	14 8 19.35	1.022	11 38 50.0	4.87	18 31.0	14	14 15 55.61	0.171	12 11 32.3	0.31	16 36.5
15	14 8 43.60	0.998	11 40 45.3	4.73	18 27.5	15	14 15 59.35	0.140	12 11 37.9	−0.15	16 32.6
16	14 9 7.27	+0.974	−11 42 37.3	−4.60	18 24.0	16	14 16 2.35	+0.110	−12 11 39.7	0.00	16 28.7
17	14 9 30.36	0.950	11 44 26.1	4.46	18 20.4	17	14 16 4.62	0.079	12 11 37.9	+0.15	16 24.8
18	14 9 52.87	0.924	11 46 11.5	4.32	18 16.8	18	14 16 6.16	0.049	12 11 32.3	0.31	16 20.9
19	14 10 14.78	0.900	11 47 53.7	4.18	18 13.2	19	14 16 6.97	+0.018	12 11 23.0	0.47	16 17.0
20	14 10 36.08	0.875	11 49 32.3	4.04	18 9.7	20	14 16 7.03	−0.013	12 11 10.0	0.62	16 13.0
21	14 10 56.78	+0.849	−11 51 7.6	−3.90	18 6.1	21	14 16 6.36	−0.043	−12 10 53.3	+0.78	16 9.1
22	14 11 16.86	0.823	11 52 39.5	3.76	18 2.5	22	14 16 4.95	0.074	12 10 32.8	0.93	16 5.1
23	14 11 36.31	0.797	11 54 8.0	3.61	17 58.9	23	14 16 2.82	0.105	12 10 8.7	1.08	16 1.1
24	14 11 55.13	0.771	11 55 32.9	3.47	17 55.2	24	14 15 59.94	0.135	12 9 40.9	1.24	15 57.1
25	14 12 13.31	0.744	11 56 54.4	3.32	17 51.6	25	14 15 56.33	0.166	12 9 9.4	1.39	15 53.1
26	14 12 30.85	+0.717	−11 58 12.4	−3.18	17 47.9	26	14 15 51.99	−0.196	−12 8 34.3	+1.54	15 49.2
27	14 12 47.74	0.690	11 59 26.9	3.03	17 44.3	27	14 15 46.92	0.226	12 7 55.5	1.69	15 45.1
28	14 13 3.98	0.663	12 0 37.9	2.88	17 40.6	28	14 15 41.13	0.256	12 7 13.1	1.84	15 41.1
29	14 13 19.56	0.635	12 1 45.2	2.73	17 37.0	29	14 15 34.62	0.286	12 6 27.1	1.99	15 37.0
30	14 13 34.47	0.607	12 2 49.1	2.59	17 33.2	30	14 15 27.39	0.316	12 5 37.5	2.14	15 33.0
31	14 13 48.72	+0.579	−12 3 49.3	−2.44	17 29.5	31	14 15 19.46	−0.346	−12 4 44.3	+2.28	15 28.9
32	14 14 2.29	+0.551	−12 4 46.0	−2.29	17 25.8	32	14 15 10.81	−0.375	−12 3 47.6	+2.43	15 24.8

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	16.″4	16.″9	17.″4	17.″9	Polar Semidiameter . .	17.″9	18.″5	19.″1	19.″6
Horizontal Parallax . .	1.5	1.6	1.6	1.7	Horizontal Parallax . .	1.7	1.7	1.8	1.8

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	14 15 34.62	−0.286	−12 6 27.1	+1.99	15 37.0
2	14 15 27.39	0.316	12 5 37.5	2.14	15 33.0
3	14 15 19.46	0.346	12 4 44.3	2.28	15 28.9
4	14 15 10.81	0.375	12 3 47.6	2.43	15 24.8
5	14 15 1.46	0.404	12 2 47.5	2.58	15 20.7
6	14 14 51.42	−0.433	−12 1 43.9	+2.72	15 16.6
7	14 14 40.69	0.461	12 0 36.8	2.86	15 12.5
8	14 14 29.27	0.490	11 59 26.4	3.00	15 8.4
9	14 14 17.17	0.518	11 58 12.6	3.14	15 4.2
10	14 14 4.40	0.546	11 56 55.4	3.28	15 0.1
11	14 13 50.96	−0.574	−11 55 34.9	+3.42	14 55.9
12	14 13 36.86	0.601	11 54 11.2	3.55	14 51.7
13	14 13 22.11	0.628	11 52 44.2	3.69	14 47.6
14	14 13 6.72	0.655	11 51 14.1	3.82	14 43.4
15	14 12 50.69	0.681	11 49 40.8	3.95	14 39.2
16	14 12 34.03	−0.707	−11 48 4.3	+4.08	14 34.9
17	14 12 16.75	0.733	11 46 24.9	4.21	14 30.7
18	14 11 58.86	0.758	11 44 42.4	4.33	14 26.5
19	14 11 40.37	0.783	11 42 57.0	4.45	14 22.2
20	14 11 21.29	0.807	11 41 8.6	4.57	14 18.0
21	14 11 1.63	−0.831	−11 39 17.4	+4.69	14 13.7
22	14 10 41.42	0.854	11 37 23.4	4.80	14 9.5
23	14 10 20.65	0.876	11 35 26.7	4.92	14 5.2
24	14 9 59.35	0.899	11 33 27.3	5.03	14 0.9
25	14 9 37.52	0.920	11 31 25.4	5.13	13 56.6
26	14 9 15.18	−0.941	−11 29 21.0	+5.23	13 52.3
27	14 8 52.37	0.961	11 27 14.2	5.33	13 48.0
28	14 8 29.07	0.980	11 25 5.0	5.43	13 43.7
29	14 8 5 32	0.999	11 22 53.5	5.52	13 39.3
30	14 7 41.13	1.017	11 20 39.9	5.61	13 35.0
31	14 7 16.51	−1.034	−11 18 24.2	+5.70	13 30.6
32	14 6 51.48	−1.051	−11 16 6.5	+5.78	13 26.3

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	19″.5	20″.0	20″.5	20″.9
Horizontal Parallax . .	1.8	1.9	1.9	2.0

APRIL.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	14 6 51.48	−1.051	−11 16 6.5	+5.78	13 26.3
2	14 6 26.07	1.067	11 13 46.9	5.86	13 21.9
3	14 6 0.28	1.082	11 11 25.5	5.93	13 17.6
4	14 5 34.14	1.096	11 9 2.4	6.00	13 13.2
5	14 5 7.66	1.110	11 6 37.6	6.07	13 8.8
6	14 4 40.87	−1.123	−11 4 11.3	+6.13	13 4.5
7	14 4 13.77	1.135	11 1 43.5	6.19	13 0.1
8	14 3 46.39	1.146	10 59 14.4	6.24	12 55.7
9	14 3 18.74	1.157	10 56 44.1	6.29	12 51.2
10	14 2 50.84	1.167	10 54 12.5	6.34	12 46.8
11	14 2 22.71	−1.176	−10 51 40.0	+6.38	12 42.4
12	14 1 54.38	1.185	10 49 6.4	6.42	12 38.1
13	14 1 25.85	1.192	10 46 32.0	6.45	12 33.7
14	14 0 57.15	1.199	10 43 56.8	6.48	12 29.3
15	14 0 28.30	1.205	10 41 21.0	6.50	12 24.9
16	13 59 59.32	−1.210	−10 38 44.7	+6.52	12 20.5
17	13 59 30.23	1.215	10 36 7.8	6.54	12 16.1
18	13 59 1.04	1.218	10 33 30.7	6.55	12 11.6
19	13 58 31.78	1.220	10 30 53.3	6.56	12 7.2
20	13 58 2.48	1.222	10 28 15.9	6.56	12 2.8
21	13 57 33.15	−1.222	−10 25 38.5	+6.56	11 58.4
22	13 57 3.81	1.222	10 23 1.2	6.55	11 54.0
23	13 56 34.49	1.221	10 20 24.1	6.54	11 49.5
24	13 56 5.20	1.219	10 17 47.4	6.52	11 45.1
25	13 55 35.98	1.216	10 15 11.2	6.50	11 40.7
26	13 55 6.83	−1.212	−10 12 35.5	+6.47	11 36.3
27	13 54 37.78	1.208	10 10 0.6	6.44	11 31.9
28	13 54 8.86	1.202	10 7 26.5	6.40	11 27.5
29	13 53 40.08	1.196	10 4 53.4	6.36	11 23.0
30	13 53 11.46	1.189	10 2 21.3	6.31	11 18.6
31	13 52 43.02	−1.181	− 9 59 50.4	+6.26	11 14.2
32	13 52 14.78	−1.172	− 9 57 20.7	+6.20	11 9.8

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	20″.9	21″.0	21″.2	21″.2
Horizontal Parallax . .	2.0	2.0	2.0	2.0

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	13 52 43.02	−1.181	−9 59 50.4	+6.26	11 14.2
2	13 52 14.78	1.172	9 57 20.7	6.20	11 9.8
3	13 51 46.76	1.162	9 54 52.5	6.14	11 5.4
4	13 51 18.98	1.152	9 52 25.7	6.08	11 1.1
5	13 50 51.45	1.141	9 50 0.5	6.01	10 56.7
6	13 50 24.19	−1.130	−9 47 36.9	+5.94	10 52.3
7	13 49 57.22	1.118	9 45 15.1	5.87	10 47.9
8	13 49 30.55	1.105	9 42 55.2	5.79	10 43.5
9	13 49 4.20	1.091	9 40 37.3	5.71	10 39.2
10	13 48 38.19	1.076	9 38 21.4	5.62	10 34.8
11	13 48 12.53	−1.061	−9 36 7.6	+5.53	10 30.4
12	13 47 47.24	1.046	9 33 56.1	5.44	10 26.1
13	13 47 22.33	1.029	9 31 46.9	5.34	10 21.8
14	13 46 57.82	1.012	9 29 40.1	5.24	10 17.4
15	13 46 33.73	0.995	9 27 35.8	5.13	10 13.1
16	13 46 10.06	−0.977	−9 25 34.0	+5.02	10 8.8
17	13 45 46.84	0.958	9 23 34.9	4.91	10 4.5
18	13 45 24.08	0.939	9 21 38.6	4.79	10 0.2
19	13 45 1.79	0.919	9 19 45.1	4.67	9 55.9
20	13 44 39.99	0.898	9 17 54.5	4.55	9 51.6
21	13 44 18.68	−0.877	−9 16 6.9	+4.42	9 47.3
22	13 43 57.89	0.855	9 14 22.3	4.29	9 43.0
23	13 43 37.64	0.833	9 12 40.8	4.16	9 38.7
24	13 43 17.91	0.810	9 11 2.6	4.03	9 34.5
25	13 42 58.74	0.787	9 9 27.6	3.89	9 30.3
26	13 42 40.13	−0.764	−9 7 55.9	+3.75	9 26.0
27	13 42 22.09	0.740	9 6 27.6	3.61	9 21.8
28	13 42 4.63	0.715	9 5 2.8	3.46	9 17.6
29	13 41 47.75	0.691	9 3 41.4	3.32	9 13.4
30	13 41 31.47	0.666	9 2 23.6	3.17	9 9.2
31	13 41 15.80	−0.640	−9 1 9.4	+3.02	9 5.0
32	13 41 0.74	−0.615	−8 59 58.8	+2.87	9 0.8

Day of the Month.	1st.	11th.	21st.	31st.
	″	″	″	″
Polar Semidiameter . .	21.2	21.0	20.6	20.2
Horizontal Parallax . .	2.0	2.0	1.9	1.9

JUNE.

Day of Month.	Apparent Right Ascension.	Var. of R. A for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	13 41 0.74	−0.615	−8 59 58.8	+2.87	9 0.8
2	13 40 46.29	0.589	8 58 51.8	2.71	8 56.6
3	13 40 32.47	0.563	8 57 48.5	2.56	8 52.5
4	13 40 19.27	0.536	8 56 48.9	2.41	8 48.4
5	13 40 6.71	0.510	8 55 53.0	2.25	8 44.2
6	13 39 54.78	−0.485	−8 55 0.9	+2.09	8 40.1
7	13 39 43.50	0.457	8 54 12.6	1.93	8 36.0
8	13 39 32.86	0.430	8 53 28.1	1.77	8 31.9
9	13 39 22.88	0.403	8 52 47.5	1.61	8 27.8
10	13 39 13.54	0.375	8 52 10.7	1.45	8 23.7
11	13 39 4.87	−0.347	−8 51 37.7	+1.29	8 19.6
12	13 38 56.86	0.320	8 51 8.7	1.13	8 15.6
13	13 38 49.51	0.292	8 50 43.5	0.97	8 11.5
14	13 38 42.83	0.264	8 50 22.2	0.80	8 7.5
15	13 38 36.83	0.236	8 50 4.9	0.64	8 3.4
16	13 38 31.50	−0.208	−8 49 51.6	+0.48	7 59.4
17	13 38 26.84	0.180	8 49 42.1	0.31	7 55.4
18	13 38 22.87	0.151	8 49 36.7	+0.14	7 51.4
19	13 38 19.58	0.123	8 49 35.2	−0.02	7 47.4
20	13 38 16.97	0.094	8 49 37.6	0.19	7 43.5
21	13 38 15.05	−0.066	−8 49 44.1	−0.36	7 39.5
22	13 38 13.81	0.037	8 49 54.5	0.52	7 35.6
23	13 38 13.25	−0.009	8 50 8.8	0.68	7 31.6
24	13 38 13.38	+0.020	8 50 27.1	0.85	7 27.7
25	13 38 14.19	0.048	8 50 49.4	1.01	7 23.8
26	13 38 15.68	+0.076	−8 51 15.6	−1.17	7 19.9
27	13 38 17.85	0.105	8 51 45.7	1.34	7 16.0
28	13 38 20.70	0.133	8 52 19.7	1.50	7 12.1
29	13 38 24.23	0.161	8 52 57.6	1.66	7 8.2
30	13 38 28.43	0.189	8 53 39.3	1.82	7 4.4
31	13 38 33.30	+0.217	−8 54 24.9	−1.98	7 0.5
32	13 38 38.83	+0.244	−8 55 14.2	−2.13	6 56.7

Day of the Month.	1st.	11th.	21st.	31st.
	″	″	″	″
Polar Semidiameter . .	20.2	19.7	19.2	18.6
Horizontal Parallax . .	1.9	1.8	1.8	1.8

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	13 38 33.30	+0.217	−8 54 24.9	−1.98	7 0.5	1	13 46 17.46	+1.003	− 9 47 2.0	−6.29	5 6.4
2	13 38 38.83	0.244	8 55 14.2	2.13	6 56.7	2	13 46 41.81	1.025	9 49 34.2	6.40	5 2.9
3	13 38 45.02	0.272	8 56 7.3	2.29	6 52.9	3	13 47 6.68	1.047	9 52 9.1	6.51	4 59.4
4	13 38 51.87	0.299	8 57 4.2	2.45	6 49.1	4	13 47 32.08	1.069	9 54 46.6	6.62	4 55.9
5	13 38 59.38	0.327	8 58 4.8	2.60	6 45.3	5	13 47 58.00	1.091	9 57 26.8	6.73	4 52.4
6	13 39 7.54	+0.354	−8 59 9.1	−2.76	6 41.5	6	13 48 24.43	+1.112	−10 0 9.6	−6.84	4 48.9
7	13 39 16.35	0.381	9 0 17.1	2.91	6 37.7	7	13 48 51.37	1.133	10 2 54.9	6.94	4 45.4
8	13 39 25.81	0.407	9 1 28.8	3.06	6 33.9	8	13 49 18.81	1.154	10 5 42.7	7.04	4 41.9
9	13 39 35.91	0.434	9 2 44.1	3.21	6 30.1	9	13 49 46.75	1.174	10 8 32.9	7.14	4 38.5
10	13 39 46.65	0.461	9 4 2.9	3.36	6 26.4	10	13 50 15.18	1.195	10 11 25.6	7.24	4 35.0
11	13 39 58.03	+0.487	−9 5 25.3	−3.51	6 22.7	11	13 50 44.11	+1.215	−10 14 20.6	−7.34	4 31.5
12	13 40 10.04	0.514	9 6 51.2	3.66	6 18.9	12	13 51 13.52	1.235	10 17 18.0	7.44	4 28.1
13	13 40 22.68	0.540	9 8 20.6	3.80	6 15.2	13	13 51 43.41	1.255	10 20 17.7	7.53	4 24.7
14	13 40 35.95	0.566	9 9 53.5	3.94	6 11.5	14	13 52 13.77	1.275	10 23 19.7	7.63	4 21.3
15	13 40 49.85	0.592	9 11 29.9	4.09	6 7.8	15	13 52 44.62	1.295	10 26 23.8	7.72	4 17.8
16	13 41 4.37	+0.618	−9 13 9.6	−4.23	6 4.1	16	13 53 15.93	+1.314	−10 29 30.2	−7.81	4 14.4
17	13 41 19.50	0.644	9 14 52.7	4.37	6 0.4	17	13 53 47.70	1.333	10 32 38.7	7.90	4 11.0
18	13 41 35.25	0.669	9 16 39.2	4.51	5 56.8	18	13 54 19.92	1.352	10 35 49.3	7.99	4 7.6
19	13 41 51.61	0.694	9 18 29.1	4.65	5 53.1	19	13 54 52.60	1.371	10 39 2.1	8.08	4 4.2
20	13 42 8.57	0.719	9 20 22.1	4.78	5 49.5	20	13 55 25.73	1.389	10 42 16.8	8.16	4 0.9
21	13 42 26.13	+0.744	−9 22 18.6	−4.92	5 45.8	21	13 55 59.29	+1.408	−10 45 33.5	−8.24	3 57.5
22	13 42 44.29	0.769	9 24 18.2	5.05	5 42.2	22	13 56 33.29	1.426	10 48 52.2	8.32	3 54.1
23	13 43 3.04	0.793	9 26 20.9	5.18	5 38.6	23	13 57 7.72	1.443	10 52 12.7	8.40	3 50.8
24	13 43 22.38	0.818	9 28 26.8	5.31	5 35.0	24	13 57 42.57	1.461	10 55 35.1	8.47	3 47.4
25	13 43 42.29	0.843	9 30 35.8	5.44	5 31.4	25	13 58 17.84	1.478	10 58 59.2	8.54	3 44.1
26	13 44 2.78	+0.866	−9 32 47.9	−5.56	5 27.8	26	13 58 53.51	+1.495	−11 2 25.1	−8.61	3 40.7
27	13 44 23.84	0.889	9 35 3.0	5.69	5 24.2	27	13 59 29.59	1.512	11 5 52.7	8.68	3 37.4
28	13 44 45.47	0.913	9 37 21.0	5.81	5 20.6	28	14 0 6.07	1.528	11 9 22.0	8.75	3 34.1
29	13 45 7.65	0.936	9 39 42.0	5.93	5 17.0	29	14 0 42.94	1.544	11 12 52.9	8.82	3 30.7
30	13 45 30.38	0.958	9 42 5.8	6.05	5 13.5	30	14 1 20.20	1.560	11 16 25.3	8.89	3 27.4
31	13 45 53.65	+0.981	−9 44 32.5	−6.17	5 10.0	31	14 1 57.84	+1.576	−11 19 59.3	−8.95	3 24.1
32	13 46 17.46	+1.003	−9 47 2.0	−6.29	5 6.4	32	14 2 35.86	+1.592	−11 23 34.7	−9.01	3 20.8

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
	″	″	″	″		″	″	″	″
Polar Semidiameter . .	18.6	18.1	17.6	17.1	Polar Semidiameter . .	17.0	16.6	16.2	15.8
Horizontal Parallax . .	1.8	1.7	1.6	1.6	Horizontal Parallax . .	1.6	1.6	1.5	1.5

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	14 2 35.86	+1.592	−11 23 34.7	− 9.01	3 20.8	1	14 24 9.26	+1.970	−13 19 38.9	−10.09	1 44.3
2	14 3 14.25	1.608	11 27 11.6	9.07	3 17.5	2	14 24 56.65	1.979	13 23 41.3	10.10	1 41.2
3	14 3 53.01	1.623	11 30 49.9	9.13	3 14.2	3	14 25 44.27	1.989	13 27 43.9	10.11	1 38.0
4	14 4 32.14	1.638	11 34 29.6	9.18	3 10.9	4	14 26 32.11	1.998	13 31 46.8	10.12	1 34.9
5	14 5 11.62	1.653	11 38 10.6	9.24	3 7.7	5	14 27 20.16	2.007	13 35 49.8	10.13	1 31.8
6	14 5 51.46	+1.667	−11 41 52.9	− 9.29	3 4.4	6	14 28 8.43	+2.015	−13 39 53.1	−10.14	1 28.6
7	14 6 31.65	1.682	11 45 36.4	9.34	3 1.1	7	14 28 56.91	2.024	13 43 56.5	10.14	1 25.5
8	14 7 12.18	1.696	11 49 21.1	9.39	2 57.9	8	14 29 45.59	2.033	13 48 0.0	10.15	1 22.4
9	14 7 53.06	1.710	11 53 7.1	9.44	2 54.6	9	14 30 34.47	2.041	13 52 3.5	10.15	1 19.3
10	14 8 34.28	1.724	11 56 54.2	9.49	2 51.4	10	14 31 23.55	2.049	13 56 7.1	10.15	1 16.2
11	14 9 15.83	+1.738	−12 0 42.3	− 9.54	2 48.1	11	14 32 12.82	+2.057	−14 0 10.7	−10.15	1 13.0
12	14 9 57.71	1.752	12 4 31.6	9.58	2 44.9	12	14 33 2.28	2.065	14 4 14.2	10.15	1 9.9
13	14 10 39.91	1.765	12 8 21.9	9.62	2 41.7	13	14 33 51.92	2.072	14 8 17.7	10.14	1 6.8
14	14 11 22.44	1.778	12 12 13.2	9.66	2 38.4	14	14 34 41.75	2.080	14 12 21.1	10.14	1 3.7
15	14 12 5.28	1.791	12 16 5.4	9.70	2 35.2	15	14 35 31.74	2.087	14 16 24.4	10.13	1 0.6
16	14 12 48.43	+1.804	−12 19 58.6	− 9.74	2 32.0	16	14 36 21.90	+2.093	−14 20 27.5	−10.13	0 57.5
17	14 13 31.89	1.817	12 23 52.7	9.78	2 28.8	17	14 37 12.22	2.100	14 24 30.5	10.12	0 54.4
18	14 14 15.64	1.829	12 27 47.6	9.81	2 25.6	18	14 38 2.70	2.106	14 28 33.2	10.11	0 51.3
19	14 14 59.68	1.841	12 31 43.3	9.84	2 22.4	19	14 38 53.33	2.112	14 32 35.6	10.09	0 48.2
20	14 15 44.02	1.853	12 35 39.7	9.87	2 19.2	20	14 39 44.10	2.118	14 36 37.7	10.08	0 45.1
21	14 16 28.64	+1.865	−12 39 36.9	− 9.90	2 16.0	21	14 40 35.01	+2.124	−14 40 39.5	−10.07	0 42.0
22	14 17 13.54	1.876	12 43 34.7	9.92	2 12.8	22	14 41 26.06	2.130	14 44 40.9	10.05	0 38.9
23	14 17 58.71	1.888	12 47 33.2	9.95	2 9.6	23	14 42 17.24	2.135	14 48 41.9	10.03	0 35.9
24	14 18 44.15	1.899	12 51 32.2	9.97	2 6.4	24	14 43 8.54	2.140	14 52 42.4	10.01	0 32.8
25	14 19 29.85	1.909	12 55 31.9	9.99	2 3.3	25	14 43 59.96	2.145	14 56 42.5	9.99	0 29.7
26	14 20 15.80	+1.920	−12 59 32.0	−10.01	2 0.1	26	14 44 51.49	+2.149	−15 0 42.1	− 9.97	0 26.6
27	14 21 2.01	1.930	13 3 32.6	10.03	1 56.9	27	14 45 43.13	2.154	15 4 41.1	9.95	0 23.6
28	14 21 48.46	1.941	13 7 33.6	10.05	1 53.8	28	14 46 34.88	2.158	15 8 39.6	9.92	0 20.5
29	14 22 35.16	1.951	13 11 35.0	10.07	1 50.6	29	14 47 26.72	2.162	15 12 37.5	9.90	0 17.4
30	14 23 22.09	1.960	13 15 36.8	10.08	1 47.5	30	14 48 18.66	2.166	15 16 34.7	9.88	0 14.3
31	14 24 9.26	+1.970	−13 19 38.9	−10.09	1 44.3	31	14 49 10.70	+2.170	−15 20 31.3	− 9.85	0 11.3
32	14 24 56.65	+1.979	−13 23 41.3	−10.10	1 41.2	32	14 50 2.82	+2.173	−15 24 27.2	− 9.82	0 8.2

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	15″.8	15″.5	15″.2	15″.0	Polar Semidiameter . .	15″.0	14″.9	14″.8	14″.7
Horizontal Parallax . .	1.5	1.5	1.4	1.4	Horizontal Parallax . .	1.4	1.4	1.4	1.4

NOTE—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	14 50 2.82	+2.173	−15 24 27.2	−9.82	0 8.2
2	14 50 55.02	2.177	15 28 22.5	9.79	0 5.1
3	14 51 47.30	2.180	15 32 16.9	9.76	0 2.1 23 59.0
4	14 52 39.66	2.183	15 36 10.7	9.72	23 56.0
5	14 53 32.08	2.186	15 40 3.7	9.69	23 52.9
6	14 54 24.57	+2.188	−15 43 55.9	−9.66	23 49.8
7	14 55 17.12	2 191	15 47 47.2	9.62	23 46.8
8	14 56 9.73	2.193	15 51 37.7	9.59	23 43.7
9	14 57 2.39	2.195	15 55 27.4	9.55	23 40.6
10	14 57 55.09	2.197	15 59 16.1	9.51	23 37.6
11	14 58 47.83	+2.198	−16 3 3.9	−9.47	23 34.5
12	14 59 40.60	2.199	16 6 50.7	9.43	23 31.5
13	15 0 33.41	2.200	16 10 36.6	9.39	23 28.4
14	15 1 26.23	2.201	16 14 21.4	9.35	23 25.4
15	15 2 19.07	2.202	16 18 5.2	9.31	23 22.3
16	15 3 11.92	+2.202	−16 21 48.0	−9.26	23 19.2
17	15 4 4.78	2.202	16 25 29.6	9.22	23 16.2
18	15 4 57.63	2.202	16 29 10.1	9.17	23 13.1
19	15 5 50.47	2.202	16 32 49.5	9.12	23 10.1
20	15 6 43.30	2.201	16 36 27.6	9.07	23 7.0
21	15 7 36.11	+2.200	−16 40 4.6	−9.02	23 4.0
22	15 8 28.89	2.199	16 43 40.4	8.06	23 0.9
23	15 9 21.64	2.197	16 47 14.9	8.91	22 57.9
24	15 10 14.35	2.195	16 50 48.1	8.86	22 54.8
25	15 11 7.02	2.194	16 54 20.1	8.80	22 51.8
26	15 11 59.64	+2.192	−16 57 50.7	−8.75	22 48.7
27	15 12 52.21	2.189	17 1 20.0	8.70	22 45.6
28	15 13 44.73	2.187	17 4 47.9	8.64	22 42.6
29	15 14 37.17	2.184	17 8 14.5	8.58	22 39.5
30	15 15 29.55	2.181	17 11 39.7	8.52	22 36.5
31	15 16 21.86	+2.178	−17 15 3.5	−8.46	22 33.4
32	15 17 14.09	+2.174	−17 18 25.8	−8.40	22 30.3

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	15 16 21.86	+2.178	−17 15 3.5	−8.46	22 33.4
2	15 17 14.09	2.174	17 18 25.8	8.40	22 30.3
3	15 18 6.23	2.171	17 21 46.7	8.34	22 27.2
4	15 18 58.28	2.167	17 25 6.2	8.28	22 24.2
5	15 19 50.24	2.163	17 28 24.2	8.22	22 21.1
6	15 20 42.10	+2.158	−17 31 40.7	−8.16	22 18.0
7	15 21 33.85	2.154	17 34 55.7	8.09	22 14.9
8	15 22 25.48	2.149	17 38 9.2	8.03	22 11.9
9	15 23 17.00	2.144	17 41 21.1	7.97	22 8.8
10	15 24 8.39	2.138	17 44 31.5	7.90	22 5.7
11	15 24 59.64	+2.133	−17 47 40.3	−7.84	22 2.6
12	15 25 50.76	2.127	17 50 47.5	7.77	21 59.5
13	15 26 41.72	2.120	17 53 53.1	7.70	21 56.4
14	15 27 32.53	2.114	17 56 57.1	7.63	21 53.4
15	15 28 23.18	2.107	17 59 59.4	7.56	21 50.3
16	15 29 13.66	+2.100	−18 3 0.1	−7.49	21 47.2
17	15 30 3.97	2.092	18 5 59.0	7.42	21 44.1
18	15 30 54.08	2.084	18 8 56.3	7.35	21 41.0
19	15 31 44.01	2.076	18 11 51.8	7.28	21 37.9
20	15 32 33.74	2.068	18 14 45.6	7.21	21 34.7
21	15 33 23.27	+2.059	−18 17 37.7	−7.14	21 31.6
22	15 34 12.58	2.050	18 20 28.0	7.06	21 28.5
23	15 35 1.68	2.041	18 23 16.5	6.99	21 25.4
24	15 35 50.55	2.032	18 26 3.2	6.92	21 22.3
25	15 36 39.20	2 022	18 28 48.2	6.84	21 19.1
26	15 37 27.60	+2.012	−18 31 31.4	−6.76	21 16.0
27	15 38 15.77	2.002	18 34 12.7	6.68	21 12.9
28	15 39 3.69	1.991	18 36 52.2	6.61	21 9.7
29	15 39 51.35	1.981	18 39 29.9	6.53	21 6.6
30	15 40 38.75	1.969	18 42 5.8	6.46	21 3.4
31	15 41 25.88	+1.958	−18 44 39.8	−6.38	21 0.3
32	15 42 12.73	+1.947	−18 47 12.0	−6.30	20 57.1

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	14.″7	14.″7	14.″8	14.″9
Horizontal Parallax . .	1.4	1.4	1.4	1.4

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	14.″9	15.″0	15.″2	15.″5
Horizontal Parallax . .	1.4	1.4	1.4	1.5

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

	JANUARY.						FEBRUARY.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	7 25 15.54	−0.860	+21 48 40.4	+2.02	12 39.7	1	7 14 46.46	−0.751	+22 12 11.0	+1.63	10 27.4
2	7 24 54.84	0.864	21 49 28.8	2.02	12 35.4	2	7 14 28.57	0.740	22 12 49.8	1.60	10 23.1
3	7 24 34.05	0.868	21 50 17.3	2.02	12 31.2	3	7 14 10.95	0.728	22 13 28.0	1.58	10 18.9
4	7 24 13.19	0.871	21 51 5.8	2.02	12 26.9	4	7 13 53.62	0.716	22 14 5.6	1.55	10 14.7
5	7 23 52.26	0.873	21 51 54.2	2.02	12 22.6	5	7 13 36.58	0.704	22 14 42.6	1.53	10 10.5
6	7 23 31.28	−0.875	+21 52 42.7	+2.02	12 18.3	6	7 13 19.83	−0.691	+22 15 19.0	+1.50	10 6.3
7	7 23 10.26	0.876	21 53 31.1	2.01	12 14.0	7	7 13 3.40	0.678	22 15 54.7	1.48	10 2.1
8	7 22 49.21	0.877	21 54 19.3	2.01	12 9.8	8	7 12 47.29	0.665	22 16 29.7	1.45	9 57.9
9	7 22 28.14	0.878	21 55 7.4	2.00	12 5.5	9	7 12 31.50	0.651	22 17 4.1	1.42	9 53.7
10	7 22 7.07	0.878	21 55 55.5	2.00	12 1.2	10	7 12 16.04	0.637	22 17 37.8	1.39	9 49.5
11	7 21 46.00	−0.877	+21 56 43.4	+1.99	11 56.9	11	7 12 0.93	−0.623	+22 18 10.9	+1.36	9 45.3
12	7 21 24.96	0.876	21 57 31.1	1.98	11 52.6	12	7 11 46.16	0.608	22 18 43.2	1.33	9 41.2
13	7 21 3.94	0.875	21 58 18.6	1.97	11 48.3	13	7 11 31.75	0.593	22 19 14.8	1.30	9 37.0
14	7 20 42.97	0.873	21 59 5.9	1.96	11 44.1	14	7 11 17.70	0.578	22 19 45.7	1.27	9 32.9
15	7 20 22.05	0.870	21 59 52.8	1.95	11 39.8	15	7 11 4.03	0.562	22 20 15.8	1.24	9 28.7
16	7 20 1.19	−0.868	+22 0 39.5	+1.94	11 35.5	16	7 10 50.74	−0.546	+22 20 45.3	+1.21	9 24.6
17	7 19 40.42	0.865	22 1 25.9	1.92	11 31.2	17	7 10 37.83	0.530	22 21 14.0	1.18	9 20.4
18	7 19 19.73	0.860	22 2 11.9	1.91	11 26.9	18	7 10 25.31	0.513	22 21 42.0	1.15	9 16.3
19	7 18 59.15	0.855	22 2 57.6	1.90	11 22.7	19	7 10 13.19	0.496	22 22 9.2	1.12	9 12.1
20	7 18 38.68	0.850	22 3 42.9	1.88	11 18.4	20	7 10 1.48	0.479	22 22 35.7	1.09	9 8.0
21	7 18 18.34	−0.845	+22 4 27.8	+1.87	11 14.1	21	7 9 50.19	−0.462	+22 23 1.5	+1.06	9 3.9
22	7 17 58.14	0.839	22 5 12.4	1.85	11 9.9	22	7 9 39.31	0.445	22 23 26.4	1.02	8 59.8
23	7 17 38.09	0.832	22 5 56.5	1.83	11 5.6	23	7 9 28.86	0.427	22 23 50.6	0.99	8 55.7
24	7 17 18.21	0.825	22 6 40.1	1.81	11 1.3	24	7 9 18.84	0.408	22 24 14.1	0.96	8 51.6
25	7 16 58.50	0.817	22 7 23.3	1.79	10 57.1	25	7 9 9.26	0.390	22 24 36.8	0.93	8 47.5
26	7 16 38.98	−0.809	+22 8 6.1	+1.77	10 52.8	26	7 9 0.11	−0.372	+22 24 58.7	+0.90	8 43.5
27	7 16 19.66	0.801	22 8 48.2	1.75	10 48.6	27	7 8 51.41	0.353	22 25 19.8	0.86	8 39.4
28	7 16 0.55	0.792	22 9 29.9	1.73	10 44.3	28	7 8 43.16	0.334	22 25 40.1	0.83	8 35.3
29	7 15 41.66	0.782	22 10 11.0	1.70	10 40.1	29	7 8 35.37	0.315	22 25 59.6	0.80	8 31.2
30	7 15 23.01	0.772	22 10 51.6	1.68	10 35.8	30	7 8 28.02	0.296	22 26 18.4	0.77	8 27.2
31	7 15 4.61	−0.762	+22 11 31.6	+1.66	10 31.6	31	7 8 21.14	−0.277	+22 26 36.4	+0.73	8 23.1
32	7 14 46.46	−0.751	+22 12 11.0	+1.63	10 27.4	32	7 8 14.72	−0.258	+22 26 53.6	+0.70	8 19.1

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	9″.7	9″.7	9″.7	9″.6	Polar Semidiameter . .	9″.6	9″.5	9″.4	9″.2
Horizontal Parallax . .	1.1	1.1	1.1	1.1	Horizontal Parallax . .	1.1	1.1	1.1	1.0

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	7 8 35.37	−0.315	+22 25 59.6	+0.80	8 31.2
2	7 8 28.02	0.296	22 26 18.4	0.77	8 27.2
3	7 8 21.14	0.277	22 26 36.4	0.73	8 23.1
4	7 8 14 72	0.258	22 26 53.6	0.70	8 19.1
5	7 8 8.76	0.239	22 27 10.0	0.67	8 15.1
6	7 8 3.26	−0.219	+22 27 25.6	+0.63	8 11.1
7	7 7 58.24	0.199	22 27 40.5	0.60	8 7.1
8	7 7 53.68	0.180	22 27 54.5	0.57	8 3.1
9	7 7 49.59	0.161	22 28 7.8	0.53	7 59.1
10	7 7 45.97	0.141	22 28 20.3	0.50	7 55.1
11	7 7 42.82	−0.121	+22 28 32.0	+0.47	7 51.1
12	7 7 40.15	0.101	22 28 42.9	0.44	7 47.1
13	7 7 37.96	0.062	22 28 53.0	0.40	7 43.2
14	7 7 36.24	0.062	22 29 2.3	0.37	7 39.2
15	7 7 35.00	0.042	22 29 10.8	0.34	7 35.2
16	7 7 34.23	−0.022	+22 29 18.5	+0.30	7 31.3
17	7 7 33.95	−0.002	22 29 25.4	0.27	7 27.4
18	7 7 34.14	+0.018	22 29 31.5	0.24	7 23.4
19	7 7 34.81	0.038	22 29 36.9	0.20	7 19.5
20	7 7 35.97	0.058	22 29 41.4	0.17	7 15.6
21	7 7 37.60	+0.078	+22 29 45.1	+0.14	7 11.7
22	7 7 39.72	0.098	22 29 48.0	0.10	7 7.8
23	7 7 42.31	0.118	22 29 50.1	0.07	7 3.9
24	7 7 45.38	0.138	22 29 51.4	+0.04	7 0.0
25	7 7 48.93	0.158	22 29 51.9	0.00	6 56.2
26	7 7 52.96	+0.178	+22 29 51.6	−0.03	6 52.3
27	7 7 57.48	0.198	22 29 50.6	0.06	6 48.5
28	7 8 2.46	0.217	22 29 48.7	0.09	6 44.6
29	7 8 7.91	0.237	22 29 46.0	0.13	6 40.8
30	7 8 13.83	0.256	22 29 42.6	0.16	6 36.9
31	7 8 20.22	+0.276	+22 29 38.3	−0.19	6 33.1
32	7 8 27.08	+0.295	+22 29 33.2	−0.23	6 29.3

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	9.″3	9.″1	8.″9	8.″8
Horizontal Parallax . .	1.0	1.0	1.0	1.0

APRIL.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	7 8 27.08	+0.295	+22 29 33.2	−0.23	6 29.3
2	7 8 34.40	0.314	22 29 27.4	0.26	6 25.5
3	7 8 42.17	0.333	22 29 20.7	0.29	6 21.7
4	7 8 50.40	0.352	22 29 13.3	0.33	6 17.9
5	7 8 59.07	0.371	22 29 5.1	0.36	6 14.1
6	7 9 8.21	+0.390	+22 28 56.0	−0.39	6 10.3
7	7 9 17.79	0.408	22 28 46.2	0.43	6 6.6
8	7 9 27.81	0.427	22 28 35.5	0.46	6 2.8
9	7 9 38.28	0.445	22 28 24.1	0.49	5 59.1
10	7 9 49.17	0.463	22 28 11.9	0.53	5 55.3
11	7 10 0.51	+0.481	+22 27 58.9	−0.56	5 51.6
12	7 10 12.27	0.500	22 27 45.0	0.59	5 47.8
13	7 10 24.46	0.517	22 27 30.4	0.63	5 44.1
14	7 10 37.08	0.535	22 27 15.0	0.66	5 40.4
15	7 10 50.12	0.552	22 26 58.8	0.69	5 36.7
16	7 11 3.58	+0.570	+22 26 41.8	−0.73	5 33.0
17	7 11 17.46	0.587	22 26 24.0	0.76	5 29.3
18	7 11 31.75	0.604	22 26 5.4	0.79	5 25.6
19	7 11 46.44	0.621	22 25 45.9	0.83	5 21.9
20	7 12 1.55	0.638	22 25 25.7	0.86	5 18.2
21	7 12 17.06	+0.654	+22 25 4.7	−0.89	5 14.5
22	7 12 32.96	0.671	22 24 42.9	0.93	5 10.8
23	7 12 49.26	0.688	22 24 20.3	0 96	5 7.1
24	7 13 5.95	0.704	22 23 56.8	0.99	5 3.5
25	7 13 23.03	0.719	22 23 32.6	1.03	4 59.8
26	7 13 40.48	+0.735	+22 23 7.6	−1.06	4 56.2
27	7 13 58.31	0.751	22 22 41.7	1.09	4 52.6
28	7 14 16.51	0.766	22 22 15.1	1.13	4 49.0
29	7 14 35.08	0.781	22 21 47.7	1.16	4 45.3
30	7 14 54.01	0.796	22 21 19.4	1.19	4 41.7
31	7 15 13.30	+0.811	+22 20 50.4	−1.23	4 38.1
32	7 15 32.94	+0.826	+22 20 20.6	−1.26	4 34.5

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	8.″8	8.″6	8.″4	8.″3
Horizontal Parallax . .	1.0	1.0	1.0	0.9

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	7 15 13.30	+0.811	+22 20 50.4	−1.23	4 38.1	1	7 27 42.95	+1.173	+21 59 18.2	−2.24	2 48.7
2	7 15 32.94	0.826	22 20 20.6	1.26	4 34.5	2	7 28 11.20	1.182	21 58 24.1	2.27	2 45.2
3	7 15 52.93	0.840	22 19 50.0	1.29	4 30.9	3	7 28 39.67	1.190	21 57 29.3	2.30	2 41.8
4	7 16 13.25	0.854	22 19 18.6	1.33	4 27.3	4	7 29 8.32	1.198	21 56 33.7	2.33	2 38.3
5	7 16 33.91	0.868	22 18 46.4	1.36	4 23.7	5	7 29 37.16	1.206	21 55 37.4	2.36	2 34.9
6	7 16 54.91	+0.882	+22 18 13.4	−1.39	4 20.2	6	7 30 6.19	+1.213	+21 54 40.4	−2.39	2 31.4
7	7 17 16.23	0.895	22 17 39.6	1.43	4 16.6	7	7 30 35.41	1.221	21 53 42.6	2.42	2 28.0
8	7 17 37.88	0.908	22 17 5.0	1.46	4 13.0	8	7 31 4.80	1.228	21 52 44.1	2.45	2 24.5
9	7 17 59.84	0.922	22 16 29.6	1.49	4 9.4	9	7 31 34.36	1.235	21 51 44.9	2.48	2 21.1
10	7 18 22.12	0.935	22 15 53.4	1 53	4 5.9	10	7 32 4.09	1.242	21 50 44.9	2.51	2 17.6
11	7 18 44.71	+0.948	+22 15 16.4	−1.56	4 2.3	11	7 32 33.99	+1.249	+21 49 44.3	−2.54	2 14.2
12	7 19 7.61	0.960	22 14 38.6	1.59	3 58.8	12	7 33 4.05	1.256	21 48 42.9	2.57	2 10.7
13	7 19 30.80	0.973	22 14 0.1	1.63	3 55.2	13	7 33 34.27	1.262	21 47 40.8	2.60	2 7.3
14	7 19 54.30	0.985	22 13 20.7	1.66	3 51.7	14	7 34 4.63	1.268	21 46 38.1	2.63	2 3.9
15	7 20 18.10	0.997	22 12 40.5	1.69	3 48.1	15	7 34 35.15	1.275	21 45 34.6	2.66	2 0.5
16	7 20 42.18	+1.009	+22 11 59.5	−1.73	3 44.6	16	7 35 5.81	+1.281	+21 44 30.4	−2.69	1 57.0
17	7 21 6.54	1.021	22 11 17.8	1.76	3 41.1	17	7 35 36.61	1.286	21 43 25.6	2.72	1 53.6
18	7 21 31.19	1.033	22 10 35.2	1.79	3 37.6	18	7 36 7.54	1.292	21 42 20.1	2.75	1 50.2
19	7 21 56.11	1.044	22 9 51.9	1.82	3 34.0	19	7 36 38.61	1.297	21 41 13.9	2.78	1 46.8
20	7 22 21.30	1.055	22 9 7.8	1.85	3 30.5	20	7 37 9.80	1.302	21 40 7.0	2.81	1 43.4
21	7 22 46.76	+1.066	+22 8 22.9	−1.88	3 27.0	21	7 37 41.11	+1.307	+21 38 59.5	−2.84	1 40.0
22	7 23 12.49	1.077	22 7 37.2	1.92	3 23.5	22	7 38 12.52	1.312	21 37 51.4	2.87	1 36.6
23	7 23 38.47	1.088	22 6 50.8	1.95	3 20.0	23	7 38 44.06	1.316	21 36 42.6	2.90	1 33.2
24	7 24 4.69	1.098	22 6 3.6	1.98	3 16.5	24	7 39 15.70	1.320	21 35 33.2	2.91	1 29.8
25	7 24 31.17	1.108	22 5 15.6	2.02	3 13.0	25	7 39 47.43	1.325	21 34 23.1	2.93	1 26.4
26	7 24 57.89	+1.118	+22 4 26.8	−2.05	3 9.5	26	7 40 19.26	+1.328	+21 33 12.5	−2.96	1 23.0
27	7 25 24.84	1.128	22 3 37.3	2.08	3 6.0	27	7 40 51.18	1.332	21 32 1.2	2.98	1 19.6
28	7 25 52.02	1.137	22 2 47.0	2.11	3 2.5	28	7 41 23.19	1.335	21 30 49.3	3.01	1 16.2
29	7 26 19.43	1.147	22 1 55.9	2.14	2 59.0	29	7 41 55.27	1.338	21 29 36.9	3.03	1 12.8
30	7 26 47.06	1.156	22 1 4.1	2.17	2 55.6	30	7 42 27.43	1.341	21 28 23.8	3.05	1 9.4
31	7 27 14.90	+1.164	+22 0 11.5	−2.21	2 52.1	31	7 42 59.66	+1.344	+21 27 10.2	−3.08	1 6.0
32	7 27 42.95	+1.173	+21 59 18.2	−2.24	2 48.7	32	7 43 31.96	+1.347	+21 25 56.0	−3.10	1 2.6

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	8.3″	8.2″	8.1″	8.0″	Polar Semidiameter . .	8.0″	7.9″	7.8″	7.8″
Horizontal Parallax . .	0.9	0.9	0.9	0.9	Horizontal Parallax . .	0.9	0.9	0.9	0.9

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	7 42 59.66	+1.344	+21 27 10.2	−3.08	1 6.0
2	7 43 31.96	1.347	21 25 56.0	3.10	1 2.6
3	7 44 4.31	1.349	21 24 41.2	3.13	0 59.2
4	7 44 36.72	1.352	21 23 25.9	3.15	0 55.8
5	7 45 9.20	1.354	21 22 10.1	3.17	0 52.4
6	7 45 41.72	+1.356	+21 20 53.7	−3.19	0 49.0
7	7 46 14.28	1.358	21 19 36.8	3.21	0 45.6
8	7 46 46.88	1.359	21 18 19.4	3.24	0 42.2
9	7 47 19.53	1.361	21 17 1.5	3.26	0 38.8
10	7 47 52.21	1.362	21 15 43.1	3.28	0 35.4
11	7 48 24.92	+1.363	+21 14 24.2	−3.30	0 32.0
12	7 48 57.65	1.364	21 13 4.8	3.32	0 28.6
13	7 49 30.41	1.365	21 11 45.0	3.34	0 25.2
14	7 50 3.19	1.366	21 10 24.7	3.35	0 21.9
15	7 50 35.97	1.366	21 9 4.0	3.37	0 18.5
16	7 51 8.76	+1.367	+21 7 42.9	−3.39	0 15.1
17	7 51 41.56	1.367	21 6 21.3	3.41	0 11.7
18	7 52 14.36	1.367	21 4 59.3	3.42	0 8.3
19	7 52 47.15	1.366	21 3 37.0	3.44	0 4.9
20	7 53 19.93	1.365	21 2 14.3	3.46	0 1.5 23 58.2
21	7 53 52.70	+1.365	+21 0 51.2	−3.47	23 54.8
22	7 54 25.44	1.364	20 59 27.7	3.48	23 51.4
23	7 54 58.16	1.362	20 58 4.0	3.50	23 48.0
24	7 55 30.84	1.361	20 56 39.9	3.51	23 44.6
25	7 56 3.50	1.360	20 55 15.5	3.52	23 41.2
26	7 56 36.11	+1.358	+20 53 50.8	−3.53	23 37.8
27	7 57 8.67	1.356	20 52 25.8	3.54	23 34.4
28	7 57 41.18	1.354	20 51 0.6	3.56	23 31.0
29	7 58 13.65	1.352	20 49 35.2	3.57	23 27.6
30	7 58 46.06	1.349	20 48 9.4	3.58	23 24.2
31	7 59 18.41	+1 346	+20 46 43.5	−3.58	23 20.8
32	7 59 50.69	+1.344	+20 45 17.4	−3.59	23 17.4

Day of the Month.	1st.	11th.	21st.	31st.
	″	″	″	″
Polar Semidiameter . .	7.8	7.8	7.8	7.8
Horizontal Parallax . .	0.9	0.9	0.9	0.9

AUGUST.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	7 59 50.69	+1.344	+20 45 17.4	−3.59	23 17.4
2	8 0 22.90	1.341	20 43 51.1	3.60	23 14.0
3	8 0 55.04	1.337	20 42 24.6	3.61	23 10.6
4	8 1 27.10	1.334	20 40 57.9	3.62	23 7.2
5	8 1 59.08	1.331	20 39 31.1	3.62	23 3.8
6	8 2 30.97	+1.327	+20 38 4.2	−3.62	23 0.4
7	8 3 2.78	1.323	20 36 37.1	3.63	22 57.0
8	8 3 34.50	1.319	20 25 10.0	3.63	22 53.6
9	8 4 6.12	1.315	20 33 42.8	3 64	22 50.2
10	8 4 37.63	1.311	20 32 15.5	3.64	22 46.8
11	8 5 9.04	+1.306	+20 30 48.2	−3.64	22 43.4
12	8 5 40.34	1.302	20 29 20.8	3.64	22 40.0
13	8 6 11.52	1.297	20 27 53.5	3.64	22 36 5
14	8 6 42.59	1.292	20 26 26.1	3 64	22 33.1
15	8 7 13.53	1.286	20 24 58.8	3.64	22 29.7
16	8 7 44.35	+1.281	+20 23 31.5	−3.64	22 26.3
17	8 8 15.03	1.275	20 22 4.2	3.63	22 22.9
18	8 8 45.57	1.269	20 20 37.1	3.63	22 19.5
19	8 9 15.97	1.263	20 19 10.0	3.63	22 16.0
20	8 9 46.22	1.257	20 17 43.1	3.62	22 12.6
21	8 10 16.31	+1.251	+20 16 16.3	−3.61	22 9.1
22	8 10 46.25	1.244	20 14 49.7	3.60	22 5.7
23	8 11 16.03	1.237	20 13 23.3	3.60	22 2.3
24	8 11 45.64	1.230	20 11 57.1	3.59	21 58.9
25	8 12 15.07	1.223	20 10 31.1	3.59	21 55.4
26	8 12 44.33	+1.215	+20 9 5.3	−3.58	21 52.0
27	8 13 13.41	1.208	20 7 39.8	3.56	21 48.6
28	8 13 42.30	1.200	20 6 14.6	3.54	21 45.1
29	8 14 11.01	1.192	20 4 49.7	3.53	21 41.6
30	8 14 39.53	1.184	20 3 25.1	3.52	21 38.2
31	8 15 7.85	+1.176	+20 2 0.9	−3.50	21 34.7
32	8 15 35.97	+1.167	+20 0 37.0	−3.49	21 31.2

Day of the Month.	1st.	11th.	21st.	31st.
	″	″	″	″
Polar Semidiameter . .	7.8	7.8	7.9	7.9
Horizontal Parallax . .	0.9	0.9	0.9	0.9

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	8 15 35.97	+1.167	+20 0 37.0	−3.49	21 31.2
2	8 16 3.88	1.159	19 59 13.5	3.47	21 27.7
3	8 16 31.59	1.150	19 57 50.4	3.45	21 24.3
4	8 16 59.09	1.141	19 56 27.7	3.43	21 20.8
5	8 17 26.36	1.132	19 55 5.5	3.42	21 17.3
6	8 17 53.42	+1.123	+19 53 43.8	−3.40	21 13.8
7	8 18 20.26	1.113	19 52 22.5	3.38	21 10.3
8	8 18 46.86	1.104	19 51 1.7	3.35	21 6.8
9	8 19 13.23	1.094	19 49 41.5	3.33	21 3.3
10	8 19 39.36	1.084	19 48 21.8	3.31	20 59.8
11	8 20 5.25	+1.074	+19 47 2.7	−3.28	20 56.3
12	8 20 30.89	1.063	19 45 44.2	3.26	20 52.8
13	8 20 56.27	1.052	19 44 26.4	3.23	20 49.3
14	8 21 21.41	1.042	19 43 9.2	3.20	20 45.7
15	8 21 46.28	1.031	19 41 52.6	3.17	20 42.2
16	8 22 10.88	+1.019	+19 40 36.8	−3.14	20 38.7
17	8 22 35.20	1.008	19 39 21.6	3.11	20 35.2
18	8 22 59.25	0.996	19 38 7.3	3.08	20 31.6
19	8 23 23.01	0.984	19 36 53.6	3.05	20 28.1
20	8 23 46.49	0.972	19 35 40.8	3.02	20 24.6
21	8 24 9.68	+0.960	+19 34 28.8	−2.98	20 21.0
22	8 24 32.57	0.947	19 33 17.6	2.95	20 17.4
23	8 24 55.17	0.935	19 32 7.3	2.91	20 13.9
24	8 25 17.46	0.922	19 30 57.8	2.87	20 10.3
25	8 25 39.44	0.909	19 29 49.3	2.85	20 6.7
26	8 26 1.11	+0.896	+19 28 41.7	−2.80	20 3.1
27	8 26 22.46	0.883	19 27 35.0	2.76	19 59.6
28	8 26 43.50	0.870	19 26 29.3	2.72	19 56.0
29	8 27 4.21	0.856	19 25 21.6	2.68	19 52.4
30	8 27 24.59	0.842	19 24 20.9	2.63	19 48.8
31	8 27 44.65	+0.829	+19 23 18.2	−2.59	19 45.2
32	8 28 4.38	+0.815	+19 22 16.5	−2.55	19 41.6

OCTOBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	8 27 44.65	+0.829	+19 23 18.2	−2.59	19 45.2
2	8 28 4.38	0.815	19 22 16.5	2.55	19 41.6
3	8 28 23.76	0.800	19 21 16.0	2.50	19 38.0
4	8 28 42.60	0.786	19 20 16.5	2.45	19 34.3
5	8 29 1.49	0.772	19 19 18.1	2.41	19 30.7
6	8 29 19.84	+0.757	+19 18 20.9	−2.36	19 27.1
7	8 29 37.83	0.742	19 17 24.9	2.31	19 23 5
8	8 29 55.46	0.727	19 16 30.1	2.26	19 19.8
9	8 30 12.73	0.712	19 15 36.4	2.21	19 16.2
10	8 30 29.63	0.696	19 14 44.0	2.16	19 12.5
11	8 30 46.16	+0.681	+19 13 52.8	−2.11	19 8.8
12	8 31 2.31	0.665	19 13 2.9	2.05	19 5.1
13	8 31 18.08	0.649	19 12 14.3	2.00	19 1.5
14	8 31 33.47	0.633	19 11 27.0	1.94	18 57.8
15	8 31 48.47	0.617	19 10 41.0	1.89	18 54.1
16	8 32 3.07	+0.600	+19 9 56.4	−1.83	18 50.4
17	8 32 17.28	0.584	19 9 13.2	1.77	18 46.7
18	8 32 31 08	0.567	19 8 31.3	1.71	18 43.0
19	8 32 44.48	0.550	19 7 50.9	1.65	18 39.3
20	8 32 57.48	0.533	19 7 11.9	1.59	18 35.6
21	8 33 10.06	+0.516	+19 6 34.4	−1.53	18 31.8
22	8 33 22.23	0.498	19 5 58.4	1.47	18 28.1
23	8 33 33.98	0.481	19 5 23.8	1.41	18 24.3
24	8 33 45.31	0.463	19 4 50.7	1.35	18 20.6
25	8 33 56.22	0.446	19 4 19.1	1.29	18 16.8
26	8 34 6.70	+0.428	+19 3 49.0	−1.22	18 13.1
27	8 34 16.76	0.410	19 3 20.5	1.16	18 9.3
28	8 34 26.39	0.392	19 2 53.6	1.09	18 5.5
29	8 34 35.60	0.374	19 2 28.2	1.03	18 1.7
30	8 34 44.36	0.356	19 2 4.4	0.96	17 58.0
31	8 34 52.69	+0.338	+19 1 42.2	−0.89	17 54.2
32	8 35 0.59	+0.320	+19 1 21.6	−0.83	17 50.4

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	7″.9	8″.0	8″.1	8″.3
Horizontal Parallax . .	0.9	0.9	0.9	0.9

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	8″.3	8″.4	8″.5	8″.7
Horizontal Parallax . .	0.9	0.9	1.0	1.0

NOTE—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	8 35 0.59	+0.320	+19 1 21.6	−0.83	17 50.4
2	8 35 8.04	0.301	19 1 2.6	0.76	17 46.5
3	8 35 15.05	0.283	19 0 45 2	0.69	17 42.7
4	8 35 21.61	0.264	19 0 29.5	0.62	17 38.9
5	8 35 27.73	0.245	19 0 15.4	0.55	17 35.1
6	8 35 33.40	+0.227	+19 0 2.9	−0.48	17 31.2
7	8 35 38.62	0.208	18 59 52.2	0.41	17 27.4
8	8 35 43 38	0.189	18 59 43.1	0.34	17 23.5
9	8 35 47.69	0.170	18 59 35.7	0.27	17 19.6
10	8 35 51.52	0.151	18 59 30.0	0.20	17 15.7
11	8 35 54.92	+0.132	+18 59 26.1	−0.13	17 11.8
12	8 35 57.85	0.112	18 59 23.8	−0.06	17 8.0
13	8 36 0.31	0.093	18 59 23.2	+0.01	17 4.1
14	8 36 2.31	0.074	18 59 24.4	0.08	17 0.2
15	8 36 3.84	0.054	18 59 27.2	0.16	16 56.3
16	8 36 4.91	+0.035	+18 59 31.8	+0.23	16 52.4
17	8 36 5.51	+0.016	18 59 38.1	0.30	16 48.4
18	8 36 5.66	−0.004	18 59 46.2	0.37	16 44.5
19	8 36 5.33	0.024	18 59 56.0	0.44	16 40.5
20	8 36 4.54	0.043	19 0 7.4	0.51	16 36.6
21	8 36 3.29	−0.062	+19 0 20.6	+0.58	16 32.7
22	8 36 1.58	0.081	19 0 35.5	0.66	16 28.7
23	8 35 59.41	0.100	19 0 52.1	0.73	16 24.7
24	8 35 56.78	0.119	19 1 10.3	0.80	16 20.7
25	8 35 53.69	0.138	19 1 30.3	0.87	16 16.7
26	8 35 50.15	−0.157	+19 1 51.9	+0.94	16 12.7
27	8 35 46.15	0.176	19 2 15.2	1.01	16 8.7
28	8 35 41.71	0.195	19 2 40.1	1.07	16 4.7
29	8 35 36.81	0.213	19 3 6.7	1.14	16 0.7
30	8 35 31.47	0.232	19 3 34.9	1.21	15 56.7
31	8 35 25.69	−0.250	+19 4 4.8	+1.28	15 52.7
32	8 35 19.46	−0 269	+19 4 36.2	+1.35	15 48.6

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	8 35 25.69	−0.250	+19 4 4.8	+1.28	15 52.7
2	8 35 19.46	0.269	19 4 36.2	1.35	15 48.6
3	8 35 12.79	0.287	19 5 9.3	1.41	15 44.6
4	8 35 5.68	0.305	19 5 43.9	1.48	15 40.5
5	8 34 58.14	0.323	19 6 20.1	1.54	15 36.4
6	8 34 50.16	−0.341	+19 6 57.8	+1.60	15 32.4
7	8 34 41.76	0.359	19 7 37.1	1.67	15 28.3
8	8 34 32.92	0.377	19 8 17.9	1.73	15 24.2
9	8 34 23.67	0.395	19 9 0.2	1.79	15 20.1
10	8 34 13.99	0.412	19 9 43.9	1.85	15 16.0
11	8 34 3.91	−0.429	+19 10 29.1	+1.91	15 11.9
12	8 33 53.41	0.446	19 11 15.8	1.97	15 7.8
13	8 33 42.51	0.463	19 12 3.8	2.03	15 3.7
14	8 33 31.21	0.479	19 12 53 2	2.09	14 59.6
15	8 33 19.52	0.495	19 13 43.9	2.15	14 55.5
16	8 33 7.45	−0.511	+19 14 36.0	+2.20	14 51.3
17	8 32 54.99	0.527	19 15 29.3	2.25	14 47.2
18	8 32 42.16	0.542	19 16 23.9	2.30	14 43.0
19	8 32 28.96	0.557	19 17 19.7	2.35	14 38.9
20	8 32 15.41	0.572	19 18 16.8	2.40	14 34.7
21	8 32 1.50	−0.587	+19 19 14.9	+2.45	14 30.5
22	8 31 47.25	0.601	19 20 14.2	2.49	14 26.4
23	8 31 32.67	0.614	19 21 14.6	2.54	14 22.2
24	8 31 17.76	0.628	19 22 16.1	2.58	14 18.0
25	8 31 2.53	0.641	19 23 18.5	2.62	14 13.8
26	8 30 46.98	−0.654	+19 24 22.0	+2.66	14 9.6
27	8 30 31.14	0.666	19 25 26.4	2.70	14 5.4
28	8 30 15.00	0.678	19 26 31.7	2.74	14 1.2
29	8 29 58.57	0.690	19 27 37.8	2.78	13 57.0
30	8 29 41.87	0.702	19 28 44.8	2.81	13 52.8
31	8 29 24.90	−0.713	+19 29 52.7	+2.84	13 48.6
32	8 29 7.67	−0.723	+19 31 1.2	+2.87	13 44.4

Day of the Month.	1st.	11th.	21st.	31st.
	″	″	″	″
Polar Semidiameter . .	8.7	8.8	9.0	9.2
Horizontal Parallax . .	1.0	1.0	1.0	1.0

Day of the Month.	1st.	11th.	21st.	31st.
	″	″	″	″
Polar Semidiameter . .	9.2	9.3	9.4	9.5
Horizontal Parallax . .	1.0	1.1	1.1	1.1

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination	Var. of Decl. for 1 Day.	Meridian Passage.	Date.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
Jan. 2	12 46 40.44	+3.047	−4 15 29.0	−17.03	17 56.5	July 1	12 32 9.80	+2.923	−2 43 49.2	−21.52	5 54.3
6	12 46 50.97	2.220	4 16 26.6	11.77	17 41.0	5	12 32 23.02	3.683	2 45 25.0	26.39	5 38.8
10	12 46 58.19	1.388	4 17 3.1	6.50	17 25.4	9	12 32 39.25	4.431	2 47 20.2	31.16	5 23.3
14	12 47 2.07	+0.553	4 17 18.6	− 1.23	17 9.7	13	12 32 58.45	5.168	2 49 34.2	35.83	5 7.9
18	12 47 2.61	−0.283	4 17 13.0	+ 4.03	16 53.9	17	12 33 20.58	5.892	2 52 6.7	40.40	4 52.6
22	12 46 59.81	−1.116	−4 16 46.4	+ 9.25	16 38.2	21	12 33 45.56	+6.596	−2 54 57.2	−44.84	4 37.3
26	12 46 53.71	1.934	4 15 59.1	14.38	16 22.3	25	12 34 13.32	7.277	2 58 5.2	49.13	4 22.0
30	12 46 44.37	2.733	4 14 51.6	19.37	16 6.4	29	12 34 43.75	7.932	3 1 29.9	53.22	4 6.8
Feb. 3	12 46 31.88	3.506	4 13 24.4	24.19	15 50.5	Aug. 2	12 35 16.73	8.557	3 5 10.7	57.12	3 51.6
7	12 46 16 36	4.249	4 11 38.3	28.82	15 34.5	6	12 35 52.17	9.156	3 9 6.7	60.84	3 36 5
11	12 45 57.93	−4.961	−4 9 34.1	+33.24	15 18.5	10	12 36 29.95	+9.729	−3 13 17.2	−64.37	3 21.4
15	12 45 36.71	5.642	4 7 12.7	37.44	15 2.4	14	12 37 9.96	10.274	3 17 41.4	67.70	3 6.3
19	12 45 12.84	6.284	4 4 34.9	41.38	14 46.3	18	12 37 52.10	10.788	3 22 18.5	70.83	2 51.3
23	12 44 46.50	6.879	4 1 42.0	45.03	14 30.1	22	12 38 36.22	11.267	3 27 7.7	73.73	2 36.3
27	12 44 17.88	7.420	3 58 35.1	48.34	14 13.9	26	12 39 22.18	11.707	3 32 8.0	76.37	2 21.3
Mar. 3	12 43 47.22	−7.902	−3 55 15.8	+51.28	13 57.7	30	12 40 9.82	12.108	−3 37 18.4	−78.75	2 6.4
7	12 43 14.74	8.327	3 51 45.4	53.83	13 41.4	Sept. 3	12 40 59.00	12.474	3 42 37.7	80.89	1 51.5
11	12 42 40.67	8.694	3 48 5.6	56.01	13 25.1	7	12 41 49.57	12.805	3 48 5.2	82.79	1 36.6
15	12 42 5.26	9.002	3 44 17.8	57.82	13 8.8	11	12 42 41.39	13.100	3 53 39.8	84.46	1 21.7
19	12 41 28.74	9.248	3 40 23.6	59.22	12 52.4	15	12 43 34.32	13.357	3 59 20.5	85.86	1 6.9
23	12 40 51.37	−9.425	−3 36 24.7	+60.19	12 36.1	19	12 44 28.19	13.569	−4 5 6.3	−87.00	0 52.0
27	12 40 13.43	9.532	3 32 22.7	60.71	12 19.7	23	12 45 22.82	13.737	4 10 56.1	87.85	0 37.2
31	12 39 35.21	9.568	3 28 19.5	60.78	12 3.3	27	12 46 18.03	13.862	4 16 48.7	88.40	0 22.4
Apr. 4	12 38 56.98	9.535	3 24 17.0	60.42	11 47.0	Oct. 1	12 47 13.66	13.944	4 22 43.0	88.68	0 7.6
8	12 38 19.01	9.439	3 20 16.7	59.65	11 30.6	5	12 48 9.54	13.968	4 28 37.8	88.70	23 49.1
12	12 37 41.55	−9.281	−3 16 20.4	+58.47	11 14.3	9	12 49 5.51	13.991	−4 34 32.3	−88.48	23 34.3
16	12 37 4.84	9.061	3 12 29.5	56.90	10 58.0	13	12 50 1.40	13.949	4 40 25.3	87.97	23 19.5
20	12 36 29.14	8.777	3 8 45.7	54.93	10 41.6	17	12 50 57.04	13.860	4 46 15.6	87.17	23 4.7
24	12 35 54.70	8.430	3 5 10.6	52.57	10 25.4	21	12 51 52.22	13.724	4 52 2.2	86.07	22 49.9
28	12 35 21.78	8.024	3 1 45.6	49.82	10 9.1	25	12 52 46.77	13.541	4 57 43.8	84.67	22 35.0
May 2	12 34 50.59	−7.565	−2 58 32.4	+46.75	9 52.8	29	12 53 40.49	13.315	−5 3 19.2	−83.02	22 20.2
6	12 34 21.32	7.060	2 55 32.0	43.38	9 36.6	Nov. 2	12 54 33.23	13.050	5 8 47.6	81.11	22 5.4
10	12 33 54.16	6.513	2 52 45.7	39.74	9 20.4	6	12 55 24.83	12.741	5 14 7.8	78.94	21 50.5
14	12 33 29.27	5.926	2 50 14.4	35.86	9 4.3	10	12 56 15.10	12.388	5 19 18.8	76.51	21 35.6
18	12 33 6.81	5.299	2 47 59.2	31.73	8 48.2	14	12 57 3.87	11.988	5 24 19.5	73.81	21 20.6
22	12 32 46.93	−4.634	−2 46 0.9	+27.37	8 32.1	18	12 57 50.95	11.544	−5 29 8.9	−70.83	21 5.7
26	12 32 29.78	3.937	2 44 20.5	22.82	8 16.1	22	12 58 36.17	11.056	5 33 45.8	67.60	20 50.7
30	12 32 15.46	3.217	2 42 58.6	18.12	8 0.2	26	12 59 19.35	10.529	5 38 9.4	64.14	20 35.7
June 3	12 32 4.06	2.481	2 41 55.7	13.32	7 44.3	30	13 0 0.36	9.968	5 42 18.7	60.46	20 20.6
7	12 31 55.63	1.731	2 41 12.1	8.44	7 28.4	Dec. 4	13 0 39.05	9.371	5 46 12.8	56.58	20 5.5
11	12 31 50.23	−0.969	−2 40 48.2	+ 3.50	7 12.6	8	13 1 15.28	+8.737	−5 49 51.1	−52.51	19 50.4
15	12 31 47.90	−0.195	2 40 44.2	− 1.50	6 56.8	12	13 1 48.89	8.065	5 53 12.6	48.22	19 35.2
19	12 31 48.68	+0.586	2 41 0.3	6.54	6 41.1	16	13 2 19.75	7.360	5 56 16.6	43.74	19 20.0
23	12 31 52.60	1.371	2 41 36.5	11.58	6 25.5	20	13 2 47.72	6.622	5 59 2.3	39.07	19 4.7
27	12 31 59.65	2.152	2 42 32.9	16.59	6 9.9	24	13 3 12.70	5.862	6 1 29.0	34.28	18 49.4
July 1	12 32 9.80	+2.923	−2 43 49.2	−21.52	5 54.3	28	13 3 34.60	+5.084	−6 3 36.4	−29.40	18 34.0
5	12 32 23.02	+3.683	−2 45 25.0	−26.39	5 38.8	32	13 3 53.35	+4.287	−6 5 24.1	−24.43	18 18.6

Greatest horizontal parallax,	**March 31, 0″.51.**	**Least horizontal parallax,**	**October 5, 0″.46.**
Greatest semidiameter,	**March 31, 1″.93.**	**Least semidiameter,**	**October 5, 1″.73.**

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination	Var. of Decl. for 1 Day.	Meridian Passage.	Date.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
Jan. 2	3 33 39.98	−4.320	+17 24 12.1	−12.06	8 45.0	July 1	3 48 49.32	+7.485	+18 20 16.2	+21.60	21 8.6
6	3 33 23.59	3.868	17 23 27.2	10.36	8 29.0	5	3 49 18.62	7.160	18 21 40.0	20.31	20 53.3
10	3 33 9.06	3.394	17 22 49.3	8.56	8 13.0	9	3 49 46.56	6.810	18 22 58.6	18.98	20 38.0
14	3 32 56.47	2.896	17 22 18.8	6.70	7 57.1	13	3 50 13.05	6.431	18 24 11.8	17.60	20 22.7
18	3 32 45.91	2.376	17 21 55.8	4.78	7 41.2	17	3 50 38.00	6.030	18 25 19.4	16.14	20 7.4
22	3 32 37.44	−1.844	+17 21 40.5	− 2.81	7 25.3	21	3 51 1.29	+5.607	+18 26 20.9	+14.63	19 52.1
26	3 32 31.15	1.300	17 21 33.3	− 0.79	7 9.5	25	3 51 22.84	5.163	18 27 16.4	13.11	19 36.7
30	3 32 27.07	0.740	17 21 34.2	+ 1.24	6 53.7	29	3 51 42.57	4.699	18 28 5.8	11.52	19 21.3
Feb. 3	3 32 25.25	−0.176	17 21 43.2	3.26	6 38.0	Aug. 2	3 52 0.41	4.219	18 28 48.7	9.92	19 5.9
7	3 32 25.67	+0.387	17 22 0.4	5.26	6 22.2	6	3 52 16.30	3.724	18 29 25.2	8.30	18 50.4
11	3 32 28.34	+0.950	+17 22 25.3	+ 7.25	6 6.6	10	3 52 30.20	+3.217	+18 29 55.1	+ 6.66	18 34.9
15	3 32 33.27	1.513	17 22 58.3	9.22	5 50.9	14	3 52 42.02	2.694	18 30 18.5	5.00	18 19.4
19	3 32 40.46	2.072	17 23 39.1	11.13	5 35.3	18	3 52 51.75	2.158	18 30 35.0	3.30	18 3.8
23	3 32 49.86	2.625	17 24 27.4	13.02	5 19.7	22	3 52 59.30	1.618	18 30 44.9	+ 1.60	17 48.2
27	3 33 1.45	3.166	17 25 23.2	14.85	5 4.2	26	3 53 4.69	1.070	18 30 47.9	− 0.07	17 32.6
Mar. 3	3 33 15.17	+3.694	+17 26 26.1	+16.62	4 48.7	30	3 53 7.88	+0.523	+18 30 44.4	− 1.72	17 16.9
7	3 33 30.96	4.204	17 27 35.9	18.29	4 33.3	Sept. 3	3 53 8.88	−0.023	18 30 34.2	3.37	17 1.2
11	3 33 48.77	4.697	17 28 52.1	19.85	4 17.8	7	3 53 7.69	0.568	18 30 17.4	5.00	16 45.4
15	3 34 8.51	5.171	17 30 14.6	21.32	4 2.4	11	3 53 4.33	1.111	18 29 54.1	6.58	16 29.6
19	3 34 30.12	5.629	17 31 42.7	22.72	3 47.0	15	3 52 58.82	1.648	18 29 24.7	8.16	16 13.8
23	3 34 53.53	+6.062	+17 33 16.3	+24.05	3 31.7	19	3 52 51.15	−2.176	+18 28 48.9	− 9.70	15 57.9
27	3 35 18.62	6.474	17 34 55.0	25.27	3 16.4	23	3 52 41.39	2.691	18 28 7.0	11.18	15 42.0
31	3 35 45.30	6.860	17 36 38.3	26.35	3 1.1	27	3 52 29.63	3.186	18 27 19.4	12.58	15 26.1
Apr. 4	3 36 13.46	7.215	17 38 25.7	27.33	2 45.8	Oct. 1	3 52 15.92	3.663	18 26 26.5	13.90	15 10.1
8	3 36 42.99	7.544	17 40 16.8	28.20	2 30.6	5	3 52 0.34	4.117	18 25 28.2	15.17	14 54.1
12	3 37 13.79	+7.848	+17 42 11.1	+28.92	2 15.4	9	3 51 43.02	−4.548	+18 24 25.1	−16.34	14 38.1
16	3 37 45.75	8.124	17 44 8.1	29.57	2 0.2	13	3 51 23.98	4.955	18 23 17.5	17.45	14 22.1
20	3 38 18.74	8.371	17 46 7.5	30.11	1 45.0	17	3 51 3.39	5.332	18 22 5.7	18.46	14 6.0
24	3 38 52.67	8.587	17 48 8.8	30.52	1 29.8	21	3 50 41.36	5.673	18 20 50.0	19.35	13 49.9
28	3 39 27.39	8.769	17 50 11.5	30.80	1 14.7	25	3 50 18.04	5.974	18 19 31.0	20.11	13 33.8
May 2	3 40 2.78	+8.917	+17 52 15.1	+30.98	0 59.6	29	3 49 53.60	−6.240	+18 18 9.2	−20.73	13 17.7
6	3 40 38.71	9.037	17 54 19.3	31.04	0 44.4	Nov. 2	3 49 28.18	6.470	18 16 45.1	21.27	13 1.5
10	3 41 15.05	9.127	17 56 23.3	30.99	0 29.3	6	3 49 1.89	6.658	18 15 19.1	21.70	12 45 3
14	3 41 51.70	9.188	17 58 26.9	30.84	0 14.2	10	3 48 34.94	6.805	18 13 51.7	21.95	12 29.2
18	3 42 28.52	9.217	18 0 29.8	30.59	23 55.3	14	3 48 7.50	6.909	18 12 23.6	22.06	12 13.0
22	3 43 5.40	+9.214	+18 2 31.5	+30.24	23 40.2	18	3 47 39.71	−6.967	+18 10 55.3	−22.06	11 56.8
26	3 43 42.20	9.178	18 4 31.6	29.78	23 25.1	22	3 47 11.80	6.975	18 9 27.3	21.90	11 40.6
30	3 44 18.77	9.105	18 6 29.6	29.20	23 9.9	26	3 46 43.97	6.940	18 8 0.3	21.55	11 24.4
June 3	3 44 55.01	9.007	18 8 25.1	28.54	22 54.8	30	3 46 16.34	6.860	18 6 35.0	21.07	11 8.2
7	3 45 30.79	8.880	18 10 17.8	27.79	22 39.7	Dec. 4	3 45 49.10	6.738	18 5 11.8	20.50	10 52.0
11	3 46 6.00	+8.720	+18 12 7.3	+26.94	22 24.5	8	3 45 22.47	−6.574	+18 3 51.1	−19.80	10 35.9
15	3 46 40.52	8.533	18 13 53.4	26.04	22 9.3	12	3 44 56.56	6.365	18 2 33.6	18.90	10 19.7
19	3 47 14.24	8 318	18 15 35.6	25.03	21 54.2	16	3 44 31.58	6.110	18 1 19.9	17.87	10 3.6
23	3 47 47.02	8.065	18 17 13.7	23.98	21 39.0	20	3 44 7.73	5.815	18 0 10.7	16.74	9 47.5
27	3 48 18.75	7.790	18 18 47.3	22.85	21 23.8	24	3 43 45.10	5.482	17 59 6.2	15.47	9 31.4
July 1	3 48 49.32	+7.485	+18 20 16.2	+21.60	21 8.6	28	3 43 23.91	−5.116	+17 58 7.0	−14.10	9 15.3
5	3 49 18.62	+7.160	+18 21 40.0	+20.31	20 53.3	32	3 43 4.21	−4.716	+17 57 13.4	−12.63	8 59.2

Least horizontal parallax,	May 19, 0″.29.	Greatest horizontal parallax,	November 20, 0″.31.
Least semidiameter,	May 19, 1″.25.	Greatest semidiameter,	November 20, 1″.33.

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 0	207 16 26.7	3 14 23.4	− 8 11.8	+2 22 21.9	−22 26.6	9.6326048	0.0737038	0.0793565
2	213 37 34.3	3 6 57.0	5 48.4	1 37 33.8	22 19.4	9.6408833	0.0847197	0.0898050
4	219 45 4.3	3 0 44.7	3 13.7	0 53 11.5	22 1.2	9.6480881	0.0946248	0.0991900
6	225 41 18.6	2 55 40.5	− 0 35.1	+0 9 34.7	21 34.4	9.6542187	0.1035109	0.1075975
8	231 28 27.8	2 51 38.6	+ 2 0.8	−0 33 1.7	21 1.1	9.6592800	0.1114586	0.1151027
10	237 8 31.5	2 48 34.4	+ 4 28.8	−1 14 26.0	−20 22.4	9.6632789	0.1185378	0.1217709
12	242 43 21.6	2 46 24.5	6 44.3	1 54 28.3	19 39.2	9.6662239	0.1248081	0.1276554
14	248 14 43.8	2 45 6.2	8 43.3	2 33 0.0	18 51.8	9.6681215	0.1303185	0.1328018
16	253 44 19.6	2 44 37.8	10 22.3	3 9 52.7	18 0.2	9.6689768	0.1351097	0.1372455
18	259 13 47.8	2 44 58.5	11 38.1	3 44 57.7	17 4.0	9.6687917	0.1392128	0.1410140
20	264 44 46.3	2 46 8.1	+12 28.4	−4 18 5.3	−16 2.6	9.6675638	0.1426512	0.1441259
22	270 18 53.2	2 48 7.2	12 51.1	4 49 4.0	14 55.0	9.6652960	0.1454394	0.1465927
24	275 57 49.2	2 50 57.6	12 44.4	5 17 40.4	13 40.0	9.6619767	0.1475852	0.1484165
26	281 43 19.2	2 54 41.7	12 7.2	5 43 38.1	12 16.0	9.6576007	0.1490861	0.1495920
28	287 37 13.9	2 59 22.6	10 58.9	6 6 37.1	10 41.0	9.6521598	0.1499322	0.1501039
30	293 41 30.2	3 5 4.2	+ 9 19.6	−6 26 13.3	− 8 52.7	9.6456477	0.1501035	0.1499267
Feb. 1	299 58 14.2	3 11 51.2	7 11.0	6 41 57.1	6 48.2	9.6380608	0.1495686	0.1490236
3	306 29 42.1	3 19 48.9	4 35.6	6 53 13.2	4 24.3	9.6294026	0.1482847	0.1473446
5	313 18 20.6	3 29 2.8	+ 1 38.6	6 59 19.2	− 1 37.5	9.6196890	0.1461952	0.1448262
7	320 26 47.7	3 39 38.6	− 1 32.6	6 59 25.4	+ 1 36.2	9.6089544	0.1432269	0.1413855
9	327 57 52.6	3 51 41.0	− 4 47.8	−6 52 34.2	+ 5 20.5	9.5972603	0.1392888	0.1369223
11	335 54 31.5	4 5 13.0	7 52.6	6 37 41.2	9 38.1	9.5847095	0.1342704	0.1313150
13	344 19 43.6	4 20 13.9	10 28.9	6 13 38.3	14 30.5	9.5714594	0.1280380	0.1244195
15	353 16 22.6	4 36 37.8	12 15.9	5 39 17.9	19 54.9	9.5577409	0.1204375	0.1160699
17	2 46 59.9	4 54 8.8	12 52.0	4 53 43.1	25 42.7	9.5438777	0.1112926	0.1060814
19	12 53 24.0	5 12 18.9	−11 58.0	−3 56 22.5	+31 37.1	9.5303023	0.1004114	0.0942586
21	23 36 12.6	5 30 24.4	9 24.1	2 47 29.0	37 9.9	9.5175619	0.0875991	0.0804104
23	34 54 17.8	5 47 23.8	5 17.3	1 28 23.4	41 42.0	9.5063007	0.0726731	0.0643715
25	46 44 12.6	6 2 0.4	− 0 6.8	−0 1 51.9	44 28.0	9.4972123	0.0554941	0.0460355
27	58 59 47.6	6 12 49.9	+ 5 15.4	+1 27 49.6	44 45.9	9.4909542	0.0359975	0.0253897
Mar. 1	71 32 10.0	6 18 36.8	+ 9 45.1	+2 55 16.6	+42 11.6	9.4880338	0.0142325	0.0025539
3	84 10 20.1	6 18 32.4	12 24.3	4 14 44.5	36 50.5	9.4887048	9.9903934	9.9778017
5	96 42 19.8	6 12 29.4	12 41.2	5 21 11.9	29 19.7	9.4929082	9.9648395	9.9515778
7	108 56 43.8	6 1 6.5	10 39.6	6 11 15.1	20 36.9	9.5002859	9.9380979	9.9244905
9	120 44 1.5	5 45 37.8	6 53.7	6 43 32.3	11 43.7	9.5102612	9.9108537	9.8972938
11	131 57 31.1	5 27 33.5	+ 2 14.5	+6 58 34.6	+ 3 28.7	9.5221511	9.8839242	9.8708623
13	142 33 29.9	5 8 20.5	− 2 28.6	6 58 13.0	− 3 37.2	9.5352725	9.8582288	9.8461456
15	152 30 55.1	4 49 10.1	6 37.0	6 44 59.6	9 22.5	9.5490128	9.8347331	9.8241078
17	161 50 45.8	4 30 52.3	9 47.8	6 21 35.7	13 48.8	9.5628671	9.8143779	9.8056409
19	170 35 20.1	4 13 57.6	11 50.8	5 50 31.0	17 5.0	9.5764447	9.7979800	9.7914607
21	178 47 42.3	3 58 41.8	−12 47.1	+5 13 54.4	−19 23.0	9.5894584	9.7861290	9.7820088
23	186 31 16.2	3 45 9.2	12 43.0	4 33 30.1	20 54.5	9.6017064	9.7791043	9.7773960
25	193 49 26.6	3 33 17.8	11 48.4	3 50 40.5	21 50.0	9.6130541	9.7768460	9.7773989
27	200 45 31.4	3 23 2.4	10 13.8	3 6 28.2	22 18.4	9.6234157	9.7789860	9.7815280
29	207 22 35.5	3 14 15.9	8 9.7	2 21 40.5	22 26.4	9.6327405	9.7849393	9.7891303
31	213 43 29.3	3 6 50.7	− 5 46.1	+1 36 52.7	−22 19.2	9.6410022	9.7940121	9.7994964
33	219 50 47.7	3 0 39.5	− 3 11.4	+0 52 31.0	−22 0.8	9.6481901	9.8054994	9.8119427

MERCURY.

GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Apr.	0	213 43 29.3	3 6 50.7	− 5 46.1	+1 36 52.7	−22 19.2	9.6410022	9.7940121	9.7994964
	2	219 50 47.7	3 0 39.5	3 11.4	0 52 31.0	22 0.8	9.6481901	9.8054994	9.8119427
	4	225 46 52.5	2 55 36.2	− 0 32.6	+0 8 55.0	21 34.0	9.6543038	9.8187553	9.8258683
	6	231 33 54.1	2 51 35.4	+ 2 3.4	−0 33 40.5	21 0 5	9.6593484	9.8332259	9.8407747
	8	237 13 52.3	2 48 32.0	4 31.2	1 15 3.5	20 21.7	9.6633308	9.8484687	9.8562680
	10	242 48 38.4	2 46 22.9	+ 6 46.4	−1 55 4.5	−19 38.5	9.6662595	9.8641382	9.8720493
	12	248 19 58.4	2 45 5.5	8 44.9	2 33 34.7	18 51.1	9.6681411	9.8799760	9.8878974
	14	253 49 33.4	2 44 37.8	10 23.6	3 10 25.9	17 59.4	9.6689804	9.8957953	9.9036550
	16	259 19 2.1	2 44 59.2	11 39.0	3 45 29.1	17 3.1	9.6687795	9.9114637	9.9192119
	18	264 50 2.6	2 46 9.4	12 28.9	4 18 34.8	16 1.6	9.6675376	9.9268908	9.9344940
	20	270 24 12.9	2 48 9.4	+12 51.3	−4 49 31.5	−14 54.0	9.6652519	9.9420161	9.9494525
	22	276 3 14.3	2 51 0.7	12 44.1	5 18 5.6	13 38.8	9.6619167	9.9567998	9.9640553
	24	281 48 51.4	2 54 45.6	12 6.4	5 44 0.7	12 14.6	9.6575247	9.9712167	9.9782822
	26	287 42 54.5	2 59 27.5	10 57.7	6 6 56.8	10 39.5	9.6520677	9.9852502	9.9921189
	28	293 47 21.2	3 5 9.9	9 17.8	6 26 29.6	8 50.9	9.6455395	9.9988865	0.0055515
	30	300 4 17.7	3 11 57.9	+ 7 8.7	−6 42 9.6	− 6 46.2	9.6379364	0.0121120	0.0185651
May	2	306 35 59.9	3 19 56.6	4 33.1	6 53 21.3	4 22.0	9.6292621	0.0249084	0.0311384
	4	313 24 55.2	3 29 11.6	+ 1 35.7	6 59 22.2	− 1 34.7	9.6195328	0.0372516	0.0432429
	6	320 33 41.7	3 39 48.8	− 1 35.8	6 59 22.4	+ 1 39.4	9.6087830	0.0491071	0.0548377
	8	328 5 8.2	3 51 52.5	4 50.6	6 52 24.3	5 24.1	9.5970752	0.0604281	0.0658690
	10	336 2 11.8	4 5 26.1	− 7 55.0	−6 37 23.6	+ 9 42.4	9.5845123	0.0711512	0.0762637
	12	344 27 52.0	4 20 28.4	10 31.0	6 13 11.6	14 35.2	9.5712532	0.0811943	0.0859295
	14	353 25 0.7	4 36 53.2	12 17.0	5 38 41.2	20 0.0	9.5575296	0.0904543	0.0947519
	16	2 56 9.9	4 54 25.2	12 51.9	4 52 55.9	25 48.1	9.5436673	0.0988044	0.1025921
	18	13 3 7.4	5 12 35.5	11 56.5	3 55 24.4	31 42.4	9.5301002	0.1060943	0.1092896
	20	23 46 28.7	5 30 40.5	− 9 20.9	−2 46 20.8	+37 14.5	9.5173770	0.1121553	0.1146683
	22	35 5 5.0	5 47 38.6	5 12.9	1 27 6.9	41 45.4	9.5061434	0.1168058	0.1185458
	24	46 55 26.8	6 2 12.3	− 0 1.8	−0 0 30.4	44 29.5	9.4970934	0.1198674	0.1207521
	26	59 11 21.7	6 12 57.6	+ 5 19.9	+1 29 11.6	44 44.9	9.4908824	0.1211837	0.1211500
	28	71 43 54.4	6 18 39.4	9 48.5	2 56 33.9	42 7.9	9.4880154	0.1206425	0.1196577
	30	84 22 4.3	6 18 29.6	+12 25.7	+4 15 52.0	+36 44.5	9.4887418	0.1181959	0.1162626
June	1	96 53 53.2	6 12 21 3	12 40.3	5 22 5.6	29 12.1	9.4929968	0.1138679	0.1110252
	3	109 7 56.2	6 0 54.0	10 36.9	6 11 52.8	20 28.6	9.5004187	0.1077517	0.1040676
	5	120 54 46.1	5 45 22.4	6 50.4	6 43 53.7	11 35.4	9.5104284	0.0999957	0.0955578
	7	132 7 42.7	5 27 16.2	+ 2 10.1	6 58 40.9	+ 3 21.6	9.5223419	0.0907774	0.0856785
	9	142 43 6.7	5 8 3.2	− 2 32.7	+6 58 6.3	− 3 43.2	9.5354769	0.0802861	0.0746217
	11	152 39 57.9	4 48 53.1	6 41.1	6 44 42.3	9 27.2	9.5492223	0.0687065	0.0625604
	13	161 59 14.7	4 30 36.0	9 50.1	6 21 10.2	13 52.4	9.5630751	0.0562027	0 0496501
	15	170 43 18.4	4 13 43.0	11 52.3	5 49 59.5	17 7.4	9.5766461	0.0429181	0.0360214
	17	178 55 12.8	3 58 28.6	12 47.5	5 13 18.6	19 24.7	9.5896494	0.0289731	0.0217844
	19	186 38 21.8	3 44 57.5	−12 42.5	+4 32 51.6	−20 55.6	9.6018847	0.0144667	0.0070294
	21	193 56 10.5	3 33 7.8	11 47.1	3 50 0.2	21 50.7	9.6132181	9.9994813	9.9918308
	23	200 51 57.0	3 22 53.8	10 12.0	3 5 47.0	22 18.7	9.6235642	9.9840857	9.9762528
	25	207 28 45.0	3 14 8.6	8 7.6	2 20 59.0	22 26.4	9.6328730	9.9683397	9.9603529
	27	213 49 25.4	3 6 44.6	5 43.8	1 36 11.4	22 19.0	9.6411187	9.9522994	9.9441863
	29	219 56 32.5	3 0 34.4	− 3 8.9	+0 51 50.3	−22 0.4	9.6482906	9.9360210	9.9278118
	31	225 52 28.0	2 55 32.0	− 0 30.3	+0 8 15.2	−21 33.5	9.6543882	9.9195673	9.9112973

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 1	225 52 28.0	2 55 32.0	− 0 30.3	+0 8 15.2	−21 33.5	9.6543882	9.9195673	9.9112973
3	231 39 22.2	2 51 32.0	+ 2 5.7	−0 34 19.3	21 0.0	9.6594169	9.9030121	9.8947233
5	237 19 14.5	2 48 29.6	4 33.4	1 15 41.2	20 21.1	9.6633838	9.8864466	9.8781952
7	242 53 56.6	2 46 21.3	6 48.3	1 55 40.8	19 37.8	9.6662969	9.8699883	9.8618449
9	248 25 14.1	2 45 4.6	8 46.6	2 34 9.6	18 50.3	9.6681628	9.8537870	9.8458409
11	253 54 48.1	2 44 37.6	+10 24.9	−3 10 59.1	−17 58.5	9.6689865	9.8380358	9.8304033
13	259 24 17.3	2 44 59.8	11 40.0	3 46 0.7	17 2.2	9.6687703	9.8229795	9.8158042
15	264 55 19.7	2 46 10.8	12 29.5	4 19 4.4	16 0.6	9.6675129	9.8089217	9.8023798
17	270 29 33.5	2 48 11.4	12 51.4	4 49 59.0	14 52.8	9.6652117	9.7962310	9.7905308
19	276 8 39.7	2 51 3.5	12 43.7	5 18 30.7	13 37.6	9.6618608	9.7853377	9.7807134
21	281 54 23.2	2 54 49.2	+12 5.6	−5 44 23.2	−12 13.3	9.6574529	9.7767210	9.7734227
23	287 48 34.5	2 59 31.9	10 56.3	6 7 16.4	10 37.9	9.6519800	9.7708800	9.7691512
25	293 53 11.3	3 5 15.3	9 16.0	6 26 45.8	8 49.1	9.6454355	9.7682900	9.7683435
27	300 10 19.4	3 12 4.2	7 6.6	6 42 22.0	6 44.1	9.6378161	9.7693494	9.7713353
29	306 42 15.5	3 20 4.2	4 30.6	6 53 29.3	4 19.4	9.6291258	9.7743174	9.7782991
31	313 31 26.9	3 29 20.4	+ 1 33.0	−6 59 25.1	− 1 32.0	9.6193808	9.7832708	9.7892098
Aug. 2	320 40 31.7	3 39 58.7	− 1 38.5	6 59 19.4	+ 1 42.5	9.6086159	9.7960818	9.8038400
4	328 12 19.5	3 52 3.7	4 53.6	6 52 14.5	5 27.8	9.5968938	9.8124292	9.8217816
6	336 9 46.4	4 5 38 4	7 57.5	6 37 5.9	9 46.8	9.5843189	9.8318359	9.8425079
8	344 35 52.8	4 20 42.3	10 32.9	6 12 45.2	14 39.9	9.5710503	9.8537223	9.8653993
10	353 33 30.7	4 37 8.3	−12 18.1	−5 38 5.1	+20 5.1	9.5573213	9.8774586	9.8898203
12	3 5 10.7	4 54 41.0	12 51.7	4 52 9.0	25 53.6	9.5434591	9.9024056	9 9151379
14	13 12 40.3	5 12 51.8	11 54.8	3 54 27.3	31 47.6	9.5298995	9.9279423	9.9407469
16	23 56 34.0	5 30 56.4	9 17.9	2 45 13.8	37 18.9	9.5171931	9.9534822	9.9660814
18	35 15 40.5	5 47 52.9	− 5 8.6	−1 25 51.9	41 48.8	9.5059865	9.9784814	9.9906220
20	47 6 28.4	6 2 23.8	+ 0 3.0	+0 0 49.7	+44 31.0	9.4969740	0.0024472	0.0139059
22	59 22 42.6	6 13 5.3	5 24.6	1 30 32.1	44 43.8	9.4908099	0.0249511	0.0355420
24	71 55 26.3	6 18 42.6	9 51.8	2 57 49.7	42 4.3	9.4879955	0.0456444	0.0552306
26	84 33 37.1	6 18 27.2	12 27.0	4 16 58.1	36 38.6	9.4887759	0.0642799	0.0727782
28	97 5 15.7	6 12 13.6	12 39.5	5 22 58.3	29 4.6	9.4930818	0.0807193	0.0881028
30	109 18 59.2	6 0 41.7	+10 34.2	+6 12 29.7	+20 20.5	9.5005472	0.0949347	0.1012259
Sept. 1	121 5 22.1	5 45 7.6	6 46.1	6 44 14.6	11 27.6	9.5105908	0.1069916	0.1122503
3	132 17 47.5	5 27 0.0	+ 2 5.7	6 58 46.9	+ 3 14.6	9 5225279	0.1170234	0.1213334
5	142 52 38.1	5 7 46.0	− 2 36.9	6 57 59.5	− 3 49.0	9.5356766	0.1252038	0.1286590
7	152 48 54.6	4 48 36.4	6 43.4	6 44 25.0	9 31.9	9.5494275	0.1317219	0.1344161
9	162 7 40.0	4 30 20.9	− 9 52.2	+6 20 44.7	−13 55.9	9.5632791	0.1367631	0.1387841
11	170 51 14.2	4 13 29.0	11 53.5	5 49 28.0	17 10.1	9.5768437	0.1404986	0.1419247
13	179 2 42.0	3 58 15.9	12 47.8	5 12 42.8	19 26.4	9.5898373	0.1430793	0.1439774
15	186 45 27.0	3 44 46.2	12 42.0	4 32 13.0	20 56.7	9.6020604	0.1446333	0.1450596
17	194 2 54.7	3 32 58.0	11 45.9	3 49 19.8	21 51.3	9.6133800	0.1452676	0.1452674
19	200 58 22.9	3 22 45.4	−10 10.5	+3 5 5.7	−22 18.9	9.6237114	0.1450684	0.1446788
21	207 34 55.4	3 14 1.4	8 5.6	2 20 17.4	22 26.4	9.6330051	0.1441048	0.1433529
23	213 55 22.5	3 6 38 5	5 41.4	1 35 29.9	22 18.9	9.6412350	0.1424285	0.1413356
25	220 2 18.7	3 0 29.4	3 6.5	0 51 9.3	22 0.2	9.6483910	0.1400783	0.1386593
27	225 58 5.3	2 55 28.0	− 0 27.8	+0 7 34.8	21 33.0	9.6544730	0.1370809	0.1353447
29	231 44 52.3	2 51 28.8	+ 2 8.0	−0 34 58.5	−20 59.4	9.6594860	0.1334517	0.1314020
31	237 24 39.0	2 48 27.2	+ 4 35.6	−1 16 19.1	−20 20.5	9.6634373	0.1291955	0.1268319

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Oct. 1	237 24 39.0	2 48 27.2	+ 4 35.6	−1 16 19.1	−20 20.5	9.6634373	0.1291955	0.1268319
3	242 59 17.1	2 46 19.7	6 50.3	1 56 17.4	19 37.1	9.6663349	0.1243098	0.1216266
5	248 30 32.1	2 45 3.6	8 48.3	2 34 44.7	18 49.6	9.6681854	0.1187808	0.1157693
7	254 0 5.0	2 44 37.6	10 26.3	3 11 32.6	17 57.7	9.6689936	0.1125886	0.1092351
9	259 29 35.0	2 45 0.5	11 41.0	3 46 32.4	17 1.3	9.6687617	0.1057042	0.1019912
11	265 0 39.4	2 46 12.2	+12 30.0	−4 19 34.2	−15 59.6	9.6674885	0.0980905	0.0939969
13	270 34 56.8	2 48 13.6	12 51.3	4 50 26.6	14 51.7	9.6651715	0.0897034	0.0852034
15	276 14 8.1	2 51 6.3	12 43.3	5 18 56.0	13 36.3	9.6618045	0.0804898	0.0755550
17	281 59 58.1	2 54 53.0	12 4.8	5 44 45.9	12 11.9	9.6573806	0.0703904	0.0649873
19	287 54 18.1	2 59 36.5	10 55.0	6 7 36.1	10 36.3	9.6518912	0.0593374	0.0534318
21	293 59 4.8	3 5 20.8	+ 9 14.4	−6 27 2.1	− 8 47.3	9.6453302	0.0472601	0.0408131
23	300 16 25.4	3 12 11.0	7 4.4	6 42 34.4	6 42.0	9.6376945	0.0340815	0.0270559
25	306 48 36.2	3 20 12.0	4 27.9	6 53 37.2	4 17.2	9.6289876	0.0197276	0.0120881
27	313 38 4.4	3 29 29.4	+ 1 30.1	6 59 27.9	− 1 29.2	9.6192263	0.0041317	9.9958525
29	320 47 28.9	3 40 9.2	− 1 41.5	6 59 16.2	+ 1 45.8	9.6084458	9.9872485	9.9783202
31	328 19 38.9	3 52 15.7	− 4 56.5	−6 52 4.3	+ 5 31.5	9.5967096	9.9690735	9.9595193
Nov. 2	336 17 31.3	4 5 51.7	8 0.5	6 36 47.8	9 50.8	9.5841224	9.9496770	9.9395751
4	344 44 5.2	4 20 56.7	10 35.0	6 12 18.1	14 44.7	9.5708442	9.9292539	9.9187696
6	353 42 13.0	4 37 24.0	12 19.2	5 37 27.9	20 10.3	9.5571099	9.9081960	9.8976279
8	3 14 25.7	4 54 57.8	12 51.6	4 51 21.4	25 58.9	9.5432480	9.8871858	9.8770172
10	13 22 29.2	5 13 8.7	−11 53.2	−3 53 28.4	+31 53.0	9.5296967	9.8672971	9.8582306
12	24 6 56.2	5 31 12.8	9 14.6	2 44 4.7	37 23.8	9.5170074	9.8500452	9.8429843
14	35 26 34.4	5 48 7.8	− 5 4.2	−1 24 34.4	41 52.1	9.5058287	9.8372946	9.8332085
16	47 17 49.6	6 2 36.0	+ 0 8.0	+0 2 12.1	44 32.4	9.4968545	9.8309217	9.8305772
18	59 34 24.2	6 13 13.3	5 28.9	1 31 55.0	44 42.8	9.4907381	9.8322433	9.8359064
20	72 7 19.0	6 18 45.6	+ 9 55.2	+2 59 7.7	+42 0.5	9.4879772	9.8414696	9.8487663
22	84 45 29.8	6 18 24.4	12 26.4	4 18 6.1	36 32.4	9.4888126	9.8575675	9.8676133
24	97 16 57.9	6 12 5.4	12 38.5	5 23 52.2	28 56.8	9.4931704	9.8786315	9.8903549
26	109 30 20.7	6 0 29.8	10 31.2	6 13 7.4	20 12.2	9.5006801	9.9025367	9.9149585
28	121 16 15.4	5 44 52.0	6 41.7	6 44 35.8	11 19.6	9.5107581	9.9274359	9.9398183
30	132 28 7.5	5 26 42.6	+ 2 1.2	+6 58 52.9	+ 3 7.4	9.5227191	9.9519866	9.9638516
Dec. 2	143 2 22.8	5 7 28.2	− 2 41.1	6 57 52.2	− 3 55.0	9.5358817	9.9753467	9.9864273
4	152 58 4.4	4 48 19.2	6 47.2	6 44 7.1	9 36.6	9.5496379	9.9970639	0.0072415
6	162 16 16.1	4 30 4.5	9 54.9	6 20 18.6	13 59.4	9.5634882	0.0169541	0.0262017
8	170 59 18.8	4 13 14.0	11 54.9	5 48 55.9	17 12.7	9.5770467	0.0349942	0.0433426
10	179 10 18.3	3 58 2.6	−12 48.2	+5 12 6.4	−19 28.2	9.5900304	0.0512584	0.0587583
12	186 52 38.3	3 44 34.6	12 41.5	4 31 33.7	20 57.8	9.6022411	0.0658588	0.0725764
14	194 9 44.1	3 32 47.7	11 44.8	3 48 38.8	21 52.0	9.6135464	0.0789280	0.0849303
16	201 4 53.0	3 22 36.6	10 8.7	3 4 23.8	22 19.2	9.6238625	0.0905992	0.0959505
18	207 41 9.2	3 13 53.8	8 3.6	2 19 35.3	22 26.4	9.6331405	0.1009983	0.1057569
20	214 1 22.1	3 6 32.0	− 5 39.1	+1 34 48.1	−22 18.6	9.6413545	0.1102388	0.1144564
22	220 8 6.6	3 0 24.2	3 4.0	0 50 28.1	21 59.8	9.6484945	0.1184212	0.1221438
24	226 3 43.7	2 55 24.1	− 0 25.3	+0 6 54.6	21 32.6	9.6545603	0.1256336	0.1288999
26	231 50 23.2	2 51 25.5	+ 2 10.3	−0 35 37.8	20 58.8	9.6595570	0.1319507	0.1347938
28	237 30 4.0	2 48 24.7	4 37.8	1 16 57.2	20 19.8	9.6634919	0.1374358	0.1398833
30	243 4 38.0	2 46 18.1	+ 6 52.3	−1 56 54.1	−19 36.4	9.6663735	0.1421416	0.1442150
32	248 35 50.8	2 45 3.0	+ 8 50.1	−2 35 19.9	−18 48.8	9.6682079	0.1461082	0.1478254

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. –2	292 38 47.6	1 34 50.2	+2 53.9	–2 2 34.2	–4 29.2	9.8621703	0.2296915	0.2291287
2	298 58 8.1	1 34 50.3	3 0.7	2 19 43.8	4 5.1	9.8622489	0.2285251	0.2278810
6	305 17 31.1	1 34 51.4	2 58.6	2 35 11.4	3 38.2	9.8622918	0.2271968	0.2264729
10	311 37 0.2	1 34 53.3	2 47.8	2 48 45.6	3 8.5	9.8622982	0.2257092	0.2249056
14	317 56 38.6	1 34 56.0	2 28.9	3 0 16.7	2 36.7	9.8622683	0.2240618	0.2231772
18	324 16 29.2	1 34 59.4	+2 2.8	–3 9 36.4	–2 2.9	9.8622023	0.2222508	0.2212815
22	330 36 34.7	1 35 3.4	1 30.7	3 16 37.8	1 27.8	9.8621011	0.2202682	0.2192103
26	336 56 56.9	1 35 7.8	0 54.2	3 21 15.4	0 51.1	9.8619659	0.2181071	0.2169579
30	343 17 37.7	1 35 12.6	+0 15.0	3 23 25.7	–0 14.0	9.8617982	0.2157623	0.2145204
Feb. 3	349 38 38.5	1 35 17.8	–0 25.0	3 23 6.8	+0 23.4	9.8616001	0.2132318	0.2118960
7	356 0 0.5	1 35 23.2	–1 3.8	–3 20 18.5	+1 0.7	9.8613739	0.2105134	0.2090832
11	2 21 44.7	1 35 28.8	1 39.6	3 15 2.3	1 37.3	9.8611223	0.2076055	0.2060788
15	8 43 51.7	1 35 34.6	2 10.5	3 7 21.7	2 12.8	9.8608483	0.2045019	0.2028737
19	15 6 22.2	1 35 40.6	2 34.9	2 57 21.8	2 46.9	9.8605553	0.2011920	0.1994559
23	21 29 16.9	1 35 46.8	2 51.7	2 45 9.4	3 19.0	9.8602466	0.1976640	0.1958146
27	27 52 36.6	1 35 53.1	–3 0.1	–2 30 53.2	+3 48.7	9.8599264	0.1939068	0.1919397
Mar. 3	34 16 21.7	1 35 59.5	2 59.6	2 14 43.1	4 15.8	9.8595982	0.1899124	0.1878250
7	40 40 32.8	1 36 6.1	2 50.1	1 56 50.9	4 39.8	9.8592663	0.1856764	0.1834657
11	47 5 10.7	1 36 12 9	2 32.1	1 37 29.5	5 0.3	9.8589348	0.1811925	0.1788558
15	53 30 16.1	1 36 19 8	2 6.5	1 16 53.1	5 17.3	9.8586078	0.1764538	0.1739854
19	59 55 49.6	1 36 26.9	–1 34.6	–0 55 16.9	+5 30.2	9.8582896	0.1714482	0.1688404
23	66 21 51.5	1 36 34.1	0 57.8	0 32 57.1	5 39.0	9.8579841	0.1661601	0.1634053
27	72 48 22.2	1 36 41.3	–0 18.1	–0 10 10.6	5 43.5	9.8576952	0.1605743	0.1576654
31	79 15 21.9	1 36 48.5	+0 22.6	+0 12 45.4	5 43.7	9.8574267	0.1546773	0.1516088
Apr. 4	85 42 50.2	1 36 55.6	1 2.2	0 35 33.4	5 39.5	9.8571820	0.1484595	0.1452284
8	92 10 46.4	1 37 2.5	+1 38.7	+0 57 55.6	+5 30.9	9.8569643	0.1419141	0.1385160
12	98 39 9.4	1 37 9.0	2 10.2	1 19 34.9	5 18.0	9.8567765	0.1350324	0.1314617
16	105 7 57.5	1 37 15.0	2 35.1	1 40 14.3	5 1.0	9.8566209	0.1278018	0.1240504
20	111 37 8.4	1 37 20.4	2 52.0	1 59 37.5	4 40.0	9.8564996	0.1202054	0.1162640
24	118 6 39.2	1 37 24.9	3 0.2	2 17 29.4	4 15.4	9.8564144	0.1122237	0.1080828
28	124 36 26.4	1 37 28.5	+2 59.2	+2 33 35.8	+3 47.3	9.8563661	0.1038393	0.0994916
May 2	131 6 25.9	1 37 31.0	2 49.0	2 47 44.1	3 16.3	9.8563555	0.0950378	0.0904770
6	137 36 33.3	1 37 32.4	2 30.1	2 59 43.1	2 42.8	9.8563826	0.0858082	0.0810302
10	144 6 43.4	1 37 32.4	2 3 5	3 9 23.5	2 7.1	9 8564475	0.0761412	0.0711396
14	150 36 50.7	1 37 31.0	1 30.7	3 16 37.9	1 29.8	9.8565489	0.0660232	0.0607899
18	157 6 49.9	1 37 28.3	+0 53.2	+3 21 20.6	+0 51.4	9.8566855	0.0554345	0.0499599
22	163 36 35.3	1 37 24.2	+0 13.0	3 23 28.4	+0 12.4	9.8568557	0.0443570	0.0386245
26	170 6 1.3	1 37 18.7	–0 27.8	3 22 59.8	–0 26.7	9.8570572	0.0327597	0.0267601
30	176 35 2.7	1 37 11.9	1 7.2	3 19 55.8	1 5.2	9.8572874	0.0206233	0.0143472
June 3	183 3 34.7	1 37 3.9	1 43.2	3 14 19.1	1 42.9	9.8575431	0.0079301	0.0013699
7	189 31 32.7	1 36 54.9	–2 13.8	+3 6 14.7	–2 19.0	9.8578212	9.9946648	9.9878127
11	195 58 53.1	1 36 45.1	2 37.6	2 55 49.4	2 53.3	9.8581180	9.9808109	9.9736557
15	202 25 33.1	1 36 34.7	2 53.5	2 43 11.7	3 25.2	9.8584296	9.9663439	9.9588713
19	208 51 30.4	1 36 23.9	3 0.6	2 28 31.9	3 54.3	9.8587522	9.9512330	9.9434247
23	215 16 43.9	1 36 12.9	2 58.6	2 12 1.6	4 20.3	9.8590816	9.9354421	9.9272809
27	221 41 13.3	1 36 1.9	–2 47.8	+1 53 53.8	–4 43.0	9.8594137	9.9189363	9.9104045
31	228 4 59.2	1 35 51.1	–2 28.6	+1 34 22.6	–5 2.0	9.8597444	9.9016827	9.8927679

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GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 1	228 4 59.2	1 35 51.1	−2 28.6	+1 34 22.6	−5 2.0	9.8597444	9.9016827	9.8927679
5	234 28 2.9	1 35 40.8	2 2.1	1 13 42.8	5 17.2	9.8600695	9.8836567	9.8743463
9	240 50 26.7	1 35 31.2	1 29.7	0 52 10.2	5 28.4	9.8603850	9.8648332	9.8551135
13	247 12 13.3	1 35 22.3	0 52.8	0 30 0.8	5 35.6	9.8606871	9.8451829	9.8350358
17	253 33 26.3	1 35 14.4	−0 13.3	+0 7 31.1	5 38.6	9.8609720	9.8246671	9.8140715
21	259 54 9.8	1 35 7.6	+0 26.7	−0 15 2.5	−5 37.5	9.8612364	9.8032437	9.7921789
25	266 14 28.2	1 35 1.8	1 5.3	0 37 23.4	5 32.3	9.8614771	9.7808728	9.7693227
29	272 34 25.7	1 34 57.2	1 40.8	0 59 15.6	5 23.1	9.8616910	9.7575282	9.7454899
Aug. 2	278 54 7.2	1 34 53.8	2 11.3	1 20 23.2	5 10.1	9.8618756	9.7332096	9.7206917
6	285 13 37.4	1 34 51.5	2 35.4	1 40 31.2	4 53.3	9.8620289	9.7079424	9.6949693
10	291 33 0.8	1 34 50.4	+2 51.9	−1 59 25.0	−4 33.1	9.8621489	9.6817824	9.6683954
14	297 52 21.8	1 34 50.3	3 0.1	2 16 51.3	4 9.6	9.8622344	9.6548240	9.6410878
18	304 11 44.4	1 34 51.2	2 59.6	2 32 37.5	3 43.1	9.8622841	9.6272145	9.6132376
22	310 31 12.5	1 34 53.0	2 50.3	2 46 32.3	3 13.9	9.8622976	9.5991998	9.5851550
26	316 50 49.2	1 34 55.6	2 32.8	2 58 25.5	2 42.4	9.8622748	9.5711704	9.5573274
30	323 10 37.7	1 34 58.9	+2 7.9	−3 8 8.6	−2 8.9	9.8622159	9.5437211	9.5304632
Sept. 3	329 30 40.5	1 35 2.7	1 36.7	3 15 34.5	1 33.8	9.8621217	9.5176813	9.5055161
7	335 50 59.8	1 35 7.0	1 0.8	3 20 37.5	0 57.6	9.8619933	9.4941206	9.4836558
11	342 11 37.2	1 35 11.7	+0 21.9	3 23 13.7	−0 20.5	9.8618323	9.4742878	9.4661897
15	348 32 34.3	1 35 16.8	−0 18.1	3 23 20.8	+0 16.9	9.8616405	9.4594738	9.4543185
19	354 53 52.2	1 35 22.2	−0 57.2	−3 20 58.4	+0 54.2	9.8614203	9.4508229	9 4490666
23	1 15 32.0	1 35 27.8	1 33.6	3 16 7.8	1 31.0	9.8611744	9.4490828	9.4508765
27	7 37 34.4	1 35 33 5	2 5.4	3 8 52.0	2 6.7	9.8609057	9.4543925	9.4596764
Oct. 1	14 0 0.0	1 35 39.4	2 31.1	2 59 15.9	2 41.1	9.8606173	9.4662775	9.4743607
5	20 22 49.6	1 35 45.6	2 49.4	2 47 26.0	3 13.5	9.8603129	9.4836618	9.4940093
9	26 46 3.7	1 35 51.6	−2 59.3	−2 33 30.7	+3 43.7	9.8599959	9.5052324	9.5171683
13	33 9 42.8	1 35 58.0	3 0.3	2 17 39.7	4 11.3	9.8596705	9.5296654	9.5425882
17	39 33 47.8	1 36 4.5	2 52.3	2 0 4.4	4 35.8	9.8593405	9.5558189	9.5692555
21	45 58 19.3	1 36 11.2	2 35.8	1 40 57.6	4 57.0	9.8590103	9.5828126	9.5964183
25	52 23 18.0	1 36 18.1	2 11.5	1 20 33.3	5 14.5	9.8586836	9.6100116	9.6235430
29	58 48 44.4	1 36 25.1	−1 40.5	−0 59 6.5	+5 28.2	9.8583648	9.6369710	9.6502611
Nov. 2	65 14 39.2	1 36 32.3	1 4.4	0 36 53.2	5 37.8	9.8580577	9.6633850	9.6763194
6	71 41 2.7	1 36 39.5	−0 25.1	−0 14 10.2	5 43.1	9.8577665	9.6890457	9.7015495
10	78 7 55.0	1 36 46.7	+0 15.5	+0 8 45.3	5 44.0	9.8574947	9.7138224	9.7258573
14	84 35 16.0	1 36 53.8	0 55.4	0 31 35.8	5 40.5	9.8572459	9.7376508	9.7492024
18	91 3 5.0	1 37 0.7	+1 32.6	+0 54 3.8	+5 32.7	9.8570232	9.7605139	9.7715883
22	97 31 21.0	1 37 7.2	2 5.1	1 15 51.7	5 20.5	9.8568298	9.7824301	9.7930433
26	104 0 2.5	1 37 13.4	2 31.2	1 36 42.6	5 4.2	9.8566677	9.8034318	9.8136000
30	110 29 7.3	1 37 18.9	2 49.7	1 56 20.2	4 43.9	9.8565395	9.8235517	9.8332896
Dec. 4	116 58 32.6	1 37 23.6	2 59.5	2 14 29.0	4 19.9	9.8564467	9.8428176	9.8521389
8	123 28 15.1	1 37 27.4	+3 0.1	+2 30 54.8	+3 52.5	9.8563905	9.8612568	9.8701752
12	129 58 10.9	1 37 30.2	2 51.5	2 45 24.6	3 22.0	9.8563717	9.8788988	9.8874332
16	136 28 15.5	1 37 31.8	2 34.1	2 57 47.0	2 48.8	9.8563905	9.8957831	9.9039544
20	142 58 23.9	1 37 32.2	2 8.8	3 7 52.3	2 13.5	9.8564468	9.9119526	9.9197842
24	149 28 30.8	1 37 31.1	1 36.9	3 15 32.7	1 36.5	9.8565396	9.9274533	9.9349653
28	155 58 30.8	1 37 28.6	+1 0.0	+3 20 42.4	+0 58.2	9.8566679	9.9423242	9.9495340
32	162 28 18.2	1 37 24.8	+0 20.2	+3 23 17.5	+0 19.3	9.8568298	9.9565972	9.9635165

MARS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
Jan. 2	324 55 26.2	38 1.14	−11.6	−1 50 22.0	+ 8.01	0.1408215	0.3435411	0.3445742
6	327 27 35.7	38 3.49	16.2	1 49 43.4	11.26	0.1405974	0.3455992	0.3466167
10	329 59 53.1	38 5.05	20.7	1 48 51.9	14.46	0.1404455	0.3476273	0.3486315
14	332 32 15.1	38 5.84	25.0	1 47 47.7	17.65	0.1403661	0.3496290	0.3506200
18	335 4 38.8	38 5.85	29.2	1 46 30.7	20.82	0.1403592	0.3516047	0.3525822
22	337 37 0.9	38 5.10	−33.1	−1 45 1.1	+23.92	0.1404251	0.3535521	0.3545144
26	340 9 18.6	38 3.59	36.8	1 43 19.3	26.97	0.1405637	0.3554691	0.3564157
30	342 41 28.6	38 1.28	40.0	1 41 25.3	29.96	0.1407743	0.3573543	0.3582855
Feb. 3	345 13 27.8	37 58.25	43.1	1 39 19.6	32.85	0.1410566	0.3592103	0.3601284
7	347 45 13.6	37 54.47	45.9	1 37 2.5	35.66	0.1414096	0.3610403	0.3619463
11	350 16 42.6	37 49.94	−48.1	−1 34 34.3	+38.38	0.1418324	0.3628463	0.3637405
15	352 47 52.1	37 44.71	50.1	1 31 55.5	40.99	0.1423237	0.3646282	0.3655091
19	355 18 39.4	37 38.81	51.6	1 29 6.4	43.49	0.1428825	0.3663823	0.3672477
23	357 49 1.7	37 32.21	52.8	1 26 7.6	45.88	0.1435072	0.3681048	0.3689529
27	0 18 56.3	37 24.97	53.5	1 22 59.4	48.14	0.1441960	0.3697922	0.3706225
Mar. 3	2 48 20.7	37 17.10	−53.9	−1 19 42.5	+50.26	0.1449471	0.3714441	0.3722573
7	5 17 12.3	37 8.65	53.9	1 16 17.3	52.27	0.1457585	0.3730625	0.3738595
11	7 45 29.3	36 59.69	53.4	1 12 44.8	54.14	0.1466284	0.3746483	0.3754287
15	10 13 9.1	36 50.15	52.5	1 9 4.2	55.86	0.1475545	0.3762003	0.3769623
19	12 40 9.5	36 40.07	51.2	1 5 17.4	57.45	0.1485339	0.3777143	0.3784553
23	15 6 29.1	36 29.60	−49.7	−1 1 24.6	+58.90	0.1495651	0.3791848	0.3799024
27	17 32 5.7	36 18.64	47.7	0 57 26.2	60.20	0.1506453	0.3806076	0.3812998
31	19 56 57.7	36 7.27	45.5	0 53 23.0	61.35	0.1517717	0.3819796	0.3826465
Apr. 4	22 21 3.4	35 55.56	42.9	0 49 15.4	62.37	0.1529417	0.3833010	0.3839433
8	24 44 21.6	35 43.50	39.9	0 45 4.0	63.25	0.1541531	0.3845729	0.3851897
12	27 6 51.0	35 31.12	−36.9	−0 40 49.4	+64.00	0.1554028	0.3857934	0.3863828
16	29 28 30.3	35 18.50	33.5	0 36 32.0	64.60	0.1566882	0.3869577	0.3875173
20	31 49 18.7	35 5.61	30.0	0 32 12.6	65.06	0.1580067	0.3880605	0.3885868
24	34 9 14.7	34 52.52	26.2	0 27 51.5	65.42	0.1593555	0.3890954	0.3895860
28	36 28 18.7	34 39.30	22.3	0 23 29.2	65.64	0.1607318	0.3900586	0.3905132
May 2	38 46 29.1	34 25.87	−18.2	−0 19 6.4	+65.73	0.1621329	0.3909495	0.3913676
6	41 3 45.5	34 12.35	14.1	0 14 43.4	65.70	0.1635561	0.3917675	0.3921490
10	43 20 7.8	33 58.74	10.0	0 10 20.8	65.55	0.1649989	0.3925118	0.3928548
14	45 35 35.3	33 45.07	5.8	0 5 59.0	65.31	0.1664587	0.3931778	0.3934797
18	47 50 8.4	33 31.41	− 1.6	−0 1 38.3	64.96	0.1679328	0.3937593	0.3940163
22	50 3 46.5	33 17.70	+ 2.6	+0 2 40.7	+64.50	0.1694184	0.3942498	0.3944590
26	52 16 29.9	33 4.00	6.7	0 6 57.7	63.95	0.1709133	0.3946440	0.3948045
30	54 28 18.5	32 50.31	10.8	0 11 12.3	63.31	0.1724151	0.3949404	0.3950519
June 3	56 39 12.5	32 36.67	14.8	0 15 24.2	62.59	0.1739213	0.3951388	0.3952007
7	58 49 12.0	32 23.12	18.7	0 19 33.0	61.78	0.1754296	0.3952374	0.3952484
11	60 58 17.7	32 9.72	+22.4	+0 23 38.4	+60.90	0.1769382	0.3952330	0.3951901
15	63 6 30.0	31 56.46	26.0	0 27 40.2	59.94	0.1784445	0.3951189	0.3950185
19	65 13 49.6	31 43.32	29.5	0 31 38.0	58.91	0.1799464	0.3948881	0.3947270
23	67 20 16.8	31 30.29	32.7	0 35 31.6	57.82	0.1814420	0.3945351	0.3943118
27	69 25 52.1	31 17.39	35.7	0 39 20.7	56.70	0.1829295	0.3940570	0.3937706
July 1	71 30 36.2	31 4.74	+38.6	+0 43 5.2	+55.51	0.1844067	0.3934527	0.3931029
5	73 34 30.3	30 52.26	+41.2	+0 46 44.8	+54.26	0.1858718	0.3927211	0.3923066

MARS.

GREENWICH MEAN NOON.

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	° ′ ″	′ ″	″	° ′ ″	″			
July 1	71 30 36.2	31 4.74	+38.6	+0 43 5.2	+55.51	0.1844067	0.3934527	0.3931029
5	73 34 30.3	30 52.26	41.2	0 46 44.8	54.26	0.1858718	0.3927211	0.3923066
9	75 37 34.6	30 39.98	43.6	0 50 19.3	52.96	0.1873234	0.3918588	0.3913767
13	77 39 50.3	30 27.90	45.8	0 53 48.5	51.64	0.1887595	0.3908595	0.3903063
17	79 41 18.1	30 16.05	47.6	0 57 12.4	50.27	0.1901787	0.3897159	0.3890876
21	81 41 59.0	30 4.41	+49.2	+1 0 30.7	+48.85	0.1915794	0.3884212	0.3877158
25	83 41 53.7	29 53.01	50.6	1 3 43.2	47.41	0.1929600	0.3869716	0.3861882
29	85 41 3.5	29 41.90	51.8	1 6 50.0	45.96	0.1943194	0.3853653	0.3845031
Aug. 2	87 39 29.3	29 31.04	52.8	1 9 50.9	44.46	0.1956560	0.3836013	0.3826593
6	89 37 12.2	29 20.42	53.4	1 12 45.7	42.94	0.1969687	0.3816764	0.3806515
10	91 34 13.1	29 10.10	+53.8	+1 15 34.4	+41.40	0.1982561	0.3795838	0.3784723
14	93 30 33.4	29 0.00	53.9	1 18 16.9	39.84	0.1995171	0.3773158	0.3761136
18	95 26 13.5	28 50.19	53.8	1 20 53.1	38.26	0.2007510	0.3748647	0.3735685
22	97 21 15.3	28 40.70	53.5	1 23 23.0	36.69	0.2019562	0.3722250	0.3708340
26	99 15 39.5	28 31.48	52.9	1 25 46.6	35.10	0.2031321	0.3693949	0.3679076
30	101 9 27.4	28 22.54	+52.1	+1 28 3.8	+33.49	0.2042778	0.3663721	0.3647876
Sept. 3	103 2 40.2	28 13.87	51.0	1 30 14.5	31.86	0.2053922	0.3631535	0.3614689
7	104 55 18.8	28 5.49	49.8	1 32 18.7	30.24	0.2064748	0.3597326	0.3579434
11	106 47 24.5	27 57.40	48.3	1 34 16.4	28.61	0.2075242	0.3561001	0.3542018
15	108 38 58.4	27 49.64	46.7	1 36 7.6	26.98	0.2085403	0.3522475	0.3502362
19	110 30 2.0	27 42.16	+44.9	+1 37 52.2	+25.33	0.2095220	0.3481678	0.3460419
23	112 20 36.1	27 34.97	42.9	1 39 30.2	23.70	0.2104689	0.3438577	0.3416154
27	114 10 42.2	27 28.08	40.7	1 41 1.8	22.07	0.2113804	0.3393146	0.3369545
Oct. 1	116 0 21.0	27 21.49	38.4	1 42 26.8	20.42	0.2122557	0.3345348	0.3320544
5	117 49 34.5	27 15.22	35.9	1 43 45.2	18.79	0.2130945	0.3295115	0.3269055
9	119 38 23.2	27 9.22	+33.2	+1 44 57.1	+17.16	0.2138961	0.3242346	0.3214977
13	121 26 48.7	27 3.55	30.5	1 46 2.5	15.53	0.2146602	0.3186939	0.3158218
17	123 14 52.0	26 58.14	27.7	1 47 1.3	13.90	0.2153864	0.3128809	0.3098704
21	125 2 34.2	26 53.05	24.7	1 47 53.7	12.29	0.2160741	0.3067904	0.3036403
25	126 49 56.8	26 48.29	21.6	1 48 39.6	10.66	0.2167230	0.3004196	0.2971275
29	128 37 0.9	26 43.79	+18.5	+1 49 19.0	+ 9.04	0.2173327	0.2937636	0.2903268
Nov. 2	130 23 47.5	26 39.57	15.3	1 49 51.9	7.44	0.2179030	0.2868157	0.2832289
6	132 10 17.9	26 35.70	12.1	1 50 18.5	5.85	0.2184337	0.2795645	0.2758214
10	133 56 33.5	26 32.12	8.9	1 50 38.7	4.25	0.2189245	0.2719980	0.2680932
14	135 42 35.3	26 28.81	5.6	1 50 52.5	2.66	0.2193748	0.2641059	0.2600353
18	137 28 24.4	26 25.81	+ 2.3	+1 51 0.0	+ 1.09	0.2197848	0.2558812	0.2516432
22	139 14 2.2	26 23.14	− 1.0	1 51 1.2	− 0.49	0.2201540	0.2473207	0.2429131
26	140 59 29.9	26 20.74	4.3	1 50 56.1	2.05	0.2204824	0.2384199	0.2338396
30	142 44 48.5	26 18.64	7.6	1 50 44.8	3.61	0.2207699	0.2291711	0.2244123
Dec. 4	144 29 59.4	26 16.84	10.8	1 50 27.2	5.16	0.2210163	0.2195621	0.2146185
8	146 15 3.6	26 15.31	−14.0	+1 50 3.5	− 6.68	0.2212213	0.2095797	0.2044446
12	148 0 2.3	26 14.12	17.1	1 49 33.8	8.21	0.2213851	0.1992121	0.1938814
16	149 44 57.0	26 13.21	20.3	1 48 57.8	9.75	0.2215075	0.1884525	0.1829245
20	151 29 48.4	26 12.61	23.3	1 48 15.8	11.26	0.2215883	0.1772977	0.1715722
24	153 14 38.3	26 12.34	26.2	1 47 27.7	12.75	0.2216278	0.1657463	0.1598196
28	154 59 27.5	26 12.30	−29.1	+1 46 33.8	−14.24	0.2216256	0.1537910	0.1476593
32	156 44 17.1	26 12.56	−31.5	+1 45 33.8	−15.73	0.2215819	0.1414228	0.1350797

JUPITER.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
Jan. 2	202 45 0.1	4 32.23	−12.3	+1 16 23.9	−1.45	0.7365749	0.7574179	0.7550883
6	203 3 9.1	4 32.25	12.6	1 16 18.0	1.48	0.7365538	0.7527221	0.7503207
10	203 21 18.2	4 32.28	12.8	1 16 12.0	1.52	0.7365322	0.7478858	0.7454189
14	203 39 27.4	4 32.31	13.1	1 16 5.9	1.55	0.7365099	0.7429217	0.7403957
18	203 57 36.7	4 32.34	13.3	1 15 59.6	1.58	0.7364870	0.7378433	0.7352668
22	204 15 46.1	4 32 37	−13.6	+1 15 53.2	−1.61	0.7364635	0.7326683	0.7300498
26	204 33 55.7	4 32.40	13.8	1 15 46.7	1.64	0.7364394	0.7274145	0.7247655
30	204 52 5.4	4 32.43	14.1	1 15 40.0	1.68	0.7364147	0.7221056	0.7194376
Feb. 3	205 10 15.1	4 32.46	14.3	1 15 33.3	1.71	0.7363894	0.7167644	0.7140888
7	205 28 25.0	4 32.49	14.6	1 15 26.4	1.74	0.7363635	0.7114140	0.7087429
11	205 46 35.0	4 32.52	−14.8	+1 15 19.4	−1.77	0.7363372	0.7060787	0.7034245
15	206 4 45.2	4 32.56	15.0	1 15 12.2	1.80	0.7363102	0.7007841	0.6981607
19	206 22 55.5	4 33.59	15 3	1 15 4.9	1.83	0.7362827	0.6955585	0.6929816
23	206 41 6.0	4 32.63	15.5	1 14 57.0	1.87	0.7362545	0.6904340	0.6879200
27	206 59 16.6	4 32.67	15.8	1 14 50.0	1.90	0.7362258	0.6854439	0.6830100
Mar. 3	207 17 27.3	4 32.70	−16.0	+1 14 42.4	−1.93	0.7361964	0.6806222	0.6782845
7	207 35 38.2	4 32.74	16.2	1 14 34.6	1.96	0.7361665	0.6760009	0.6737757
11	207 53 49.3	4 32.78	16.4	1 14 26.7	1.99	0.7361360	0.6716126	0.6695155
15	208 12 0.5	4 32.81	16.7	1 14 18.6	2.02	0.7361048	0.6674887	0.6655362
19	208 30 11.8	4 32.85	16.9	1 14 10.5	2.06	0.7360731	0.6636622	0.6618712
23	208 48 23.3	4 32.89	−17.1	+1 14 2.2	−2.09	0.7360407	0.6601669	0.6585535
27	209 6 34.9	4 32.93	17.3	1 13 53.8	2.12	0.7360076	0.6570344	0.6556136
31	209 24 46.8	4 32.98	17.6	1 13 45.2	2.15	0.7359740	0.6542937	0.6530777
Apr. 4	209 42 58.8	4 33.02	17.8	1 13 36.6	2.18	0.7359397	0.6519679	0.6509668
8	210 1 11.0	4 33.06	18.0	1 13 27.8	2.21	0.7359049	0.6500763	0.6492985
12	210 19 23.3	4 33.11	−18.2	+1 13 18.9	−2.24	0.7358694	0.6486349	0.6480874
16	210 37 35.9	4 33.15	18.4	1 13 9.8	2.27	0.7358333	0.6476570	0.6473450
20	210 55 48.6	4 33.20	18.6	1 13 0.7	2.31	0.7357968	0.6471524	0.6470798
24	211 14 1.5	4 33.24	18.8	1 12 51.4	2.34	0.7357595	0.6471267	0.6472933
28	211 32 14.5	4 33.28	19.0	1 12 42.0	2.37	0.7357217	0.6475781	0.6479807
May 2	211 50 27.8	4 33.33	−19.2	+1 12 32.4	−2.40	0.7356833	0.6484988	0.6491307
6	212 8 41.2	4 33.38	19.4	1 12 22.8	2.43	0.7356444	0.6498744	0.6507280
10	212 26 54.9	4 33.43	19.6	1 12 13.0	2 46	0.7356049	0.6516890	0.6527551
14	212 45 8.7	4 33.49	19.8	1 12 3.1	2.49	0.7355648	0.6539236	0.6551919
18	213 3 22.8	4 33.54	20.0	1 11 53.0	2.52	0.7355240	0.6565569	0.6580158
22	213 21 37.0	4 33.59	−20.2	+1 11 42.9	−2.55	0.7354827	0.6595647	0.6612002
26	213 39 51.5	4 33.64	20.4	1 11 32.6	2 58	0.7354408	0.6629181	0.6647145
30	213 58 6.1	4 33.69	20.6	1 11 22.2	2.62	0.7353984	0.6665852	0.6685259
June 3	214 16 21.0	4 33.74	20.8	1 11 11.7	2.65	0.7353553	0.6705327	0.6726014
7	214 34 36.1	4 33.80	21.0	1 11 1.0	2.68	0.7353116	0.6747283	0.6769096
11	214 52 51.3	4 33.85	−21.2	+1 10 50.3	−2.71	0.7352673	0.6791415	0.6814202
15	215 11 6.9	4 33.91	21.4	1 10 39.4	2.74	0.7352224	0.6837419	0.6861032
19	215 29 22.6	4 33.97	21.5	1 10 28.4	2.77	0.7351769	0.6884999	0.6909282
23	215 47 38.6	4 34.03	21.7	1 10 17.2	2.80	0.7351308	0.6933843	0.6958643
27	216 5 54.8	4 34.09	21.9	1 10 6.0	2.83	0.7350841	0.6983647	0.7008817
July 1	216 24 11.3	4 34.14	−22.1	+1 9 54.6	−2.86	0.7350368	0.7034121	0.7059524
5	216 42 28.0	4 34.20	−22.2	+1 9 43.1	−2.89	0.7349890	0.7084998	0.7110513

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GREENWICH MEAN NOON.

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							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
July 1	216 24 11.3	4 34.14	−22.1	+1 9 54.6	−2.86	0.7350368	0.7034121	0.7059524
5	216 42 28.0	4 34.20	22.2	1 9 43.1	2.89	0.7349890	0.7084998	0.7110513
9	217 0 44.9	4 34.26	22.4	1 9 31.5	2.92	0.7349405	0.7136045	0.7161567
13	217 19 2.1	4 34.32	22.5	1 9 19.8	2.95	0.7348915	0.7187053	0.7212479
17	217 37 19.5	4 34.38	22.7	1 9 7.9	2.98	0.7348419	0.7237818	0.7263045
21	217 55 37.1	4 34.45	−22.8	+1 8 56.0	−3.01	0.7347917	0.7288134	0.7313059
25	218 13 55.0	4 34.51	23.0	1 8 43.9	3.04	0.7347409	0.7337799	0.7362329
29	218 32 13.3	4 34.58	23.1	1 8 31.6	3.07	0.7346896	0.7386633	0.7410691
Aug. 2	218 50 31.7	4 34.64	23.3	1 8 19.3	3.10	0.7346377	0.7434488	0.7458004
6	219 8 50.4	4 34.71	23.4	1 8 6.9	3.13	0.7345853	0.7481231	0.7504153
10	219 27 9.4	4 34.78	−23.6	+1 7 54.3	−3.16	0.7345322	0.7526755	0.7549023
14	219 45 28.6	4 34.84	23.7	1 7 41.6	3.19	0.7344786	0.7570945	0.7592505
18	220 3 48.1	4 34.91	23.9	1 7 28.8	3.22	0.7344244	0.7613690	0.7634484
22	220 22 7.9	4 34.97	24.0	1 7 15.8	3.25	0.7343697	0.7654875	0.7674851
26	220 40 28.0	4 35.04	24.2	1 7 2.8	3.28	0.7343144	0.7694403	0.7713520
30	220 58 48.3	4 35.11	−24.3	+1 6 49.6	−3.31	0.7342586	0.7732197	0.7750424
Sept. 3	221 17 8.9	4 35.18	24.4	1 6 36.3	3.34	0.7342022	0.7768197	0.7785510
7	221 35 29.7	4 35.26	24.5	1 6 22.9	3.36	0.7341453	0.7802354	0.7818723
11	221 53 50.9	4 35.33	24.6	1 6 9.4	3.39	0.7340878	0.7834610	0.7850007
15	222 12 12.4	4 35.41	24.8	1 5 55.8	3.42	0.7340297	0.7864905	0.7879295
19	222 30 34.2	4 35.48	−24.9	+1 5 42.0	−3.45	0.7339711	0.7893171	0.7906526
23	222 48 56.2	4 35.55	25.0	1 5 28.2	3.48	0.7339119	0.7919356	0.7931656
27	223 7 18.6	4 35.62	25.1	1 5 14.2	3.51	0.7338522	0.7943423	0.7954656
Oct. 1	223 25 41.2	4 35.70	25.2	1 5 0.1	3.54	0.7337919	0.7965350	0.7975503
5	223 44 4.2	4 35.77	25.3	1 4 45.9	3.57	0.7337310	0.7985113	0.7994175
9	224 2 27.4	4 35.85	−25.4	+1 4 31.5	−3.60	0.7336695	0.8002685	0.8010640
13	224 20 51.0	4 35.93	25.5	1 4 17.1	3.63	0.7336075	0.8018035	0.8024862
17	224 39 14.9	4 36.01	25.6	1 4 2.5	3.66	0.7335449	0.8031119	0.8036801
21	224 57 39.1	4 36.09	25.7	1 3 47.9	3.68	0.7334818	0.8041908	0.8046435
25	225 16 3.7	4 36.17	25.8	1 3 33.1	3.71	0.7334182	0.8050384	0.8053754
29	225 34 28.5	4 36.26	−25.9	+1 3 18.2	−3.74	0.7333539	0.8056545	0.8058757
Nov. 2	225 52 53.7	4 36.34	26.0	1 3 3.2	3.77	0.7332892	0.8060389	0.8061439
6	226 11 19.2	4 36.42	26.1	1 2 48.0	3.80	0.7332239	0.8061904	0.8061781
10	226 29 45.0	4 36.50	26.1	1 2 32 8	3.83	0.7331580	0.8061071	0.8059767
14	226 48 11.2	4 36.58	26.2	1 2 17.4	3.85	0.7330916	0.8057870	0.8055376
18	227 6 37.7	4 36.67	−26.3	+1 2 2.0	−3.88	0.7330247	0.8052287	0.8048601
22	227 25 4.5	4 36.75	26.4	1 1 46.4	3.91	0.7329572	0.8044322	0.8039450
26	227 43 31.7	4 36.84	26.5	1 1 30.7	3.93	0.7328892	0.8033988	0.8027938
30	228 1 59.1	4 36.93	26.5	1 1 14.9	3 96	0.7328207	0.8021302	0.8014081
Dec. 4	228 20 27.2	4 37.02	26.6	1 0 59.0	3.99	0.7327517	0.8006275	0.7997882
8	228 38 55.4	4 37.11	−26.7	+1 0 43.0	−4.02	0.7326821	0.7988902	0.7979336
12	228 57 24.0	4 37.19	26.7	1 0 26.9	4.05	0.7326120	0.7969184	0.7958447
16	229 15 52.9	4 37.28	26.8	1 0 10.6	4.07	0.7325414	0.7947130	0.7935235
20	229 34 22.2	4 37.37	26.8	0 59 54.3	4.10	0.7324702	0.7922767	0.7909733
24	229 52 51.8	4 37.45	26.8	0 59 37.9	4.13	0.7323985	0.7896137	0.7881985
28	230 11 21.8	4 37.54	−26.9	+0 59 21.3	−4.15	0.7323263	0.7867281	0.7852031
32	230 29 52.2	4 37.64	−26.9	+0 59 4.6	−4.18	0.7322535	0.7836238	0.7819908

SATURN.

GREENWICH MEAN NOON.

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	° ′ ″	′ ″	″	° ′ ″	″			
Jan. 2	108 47 43.3	2 13.90	−13.2	−0 10 10.8	+5.81	0.9564040	0.9068595	0.9066570
6	108 56 38.9	2 13.89	12.7	0 9 47.6	5.81	0.9564207	0.9065227	0.9064568
10	109 5 34.4	2 13.87	12.2	0 9 24.3	5.81	0.9564376	0.9064592	0.9065301
14	109 14 29.9	2 13.86	11.7	0 9 1.1	5.81	0.9564547	0.9066692	0.9068764
18	109 23 25.3	2 13.85	11.2	0 8 37.9	5.81	0.9564719	0.9071512	0.9074936
22	109 32 20.7	2 13.84	−10.7	−0 8 14.7	+5.81	0.9564892	0.9079027	0.9083780
26	109 41 16.1	2 13.82	10.2	0 7 51.4	5.81	0.9565067	0.9089181	0.9095220
30	109 50 11.4	2 13.81	9.7	0 7 28.2	5.81	0.9565243	0.9101880	0.9109147
Feb. 3	109 59 6.6	2 13.80	9.2	0 7 4.9	5.81	0.9565420	0.9117006	0.9125443
7	110 8 1.8	2 13.79	8.6	0 6 41.7	5.81	0.9565599	0.9134437	0.9143969
11	110 16 57.0	2 13.78	− 8.1	−0 6 18.5	+5.81	0.9565780	0.9154023	0.9164581
15	110 25 52.1	2 13.76	7.6	0 5 55.2	5.81	0.9565962	0.9175624	0.9187135
19	110 34 47.1	2 13.75	7.1	0 5 32.0	5.81	0.9566145	0.9199091	0.9211473
23	110 43 42.1	2 13.74	6.6	0 5 8.8	5.81	0.9566330	0.9224257	0.9237419
27	110 52 37.1	2 13.73	6.1	0 4 45.5	5.81	0.9566516	0.9250935	0.9264783
Mar. 3	111 1 32.0	2 13.72	− 5.6	−0 4 22.3	+5.81	0.9566704	0.9278939	0.9293378
7	111 10 26.9	2 13.71	5.1	0 3 59.0	5.81	0.9566894	0.9308077	0.9323015
11	111 19 21.7	2 13.70	4.6	0 3 35.8	5.81	0.9567084	0.9338170	0.9353519
15	111 28 16.5	2 13.68	4.1	0 3 12.6	5.81	0.9567276	0.9369042	0.9384720
19	111 37 11.2	2 13.67	3.6	0 2 49.3	5.81	0.9567470	0.9400532	0.9416455
23	111 46 5.9	2 13.66	− 3.1	−0 2 26.1	+5.81	0.9567665	0.9432469	0.9448551
27	111 55 0.5	2 13.64	2.6	0 2 2.8	5.81	0.9567862	0.9464680	0.9480833
31	112 3 55.1	2 13.63	2.1	0 1 39.6	5.81	0.9568060	0.9496993	0.9513142
Apr. 4	112 12 49.6	2 13.61	1.6	0 1 16.4	5.81	0.9568259	0.9529260	0.9545327
8	112 21 44.0	2 13.60	1.1	0 0 53.1	5.81	0.9568460	0.9561329	0.9577252
12	112 30 38.4	2 13.59	− 0.6	−0 0 29.9	+5.81	0.9568662	0.9593081	0.9608800
16	112 39 32.8	2 13.58	− 0.1	−0 0 6.7	5.81	0.9568865	0.9624394	0.9639848
20	112 48 27.1	2 13.56	+ 0.4	+0 0 16.6	5.81	0.9569070	0.9655148	0.9670280
24	112 57 21.3	2 13.55	0.9	0 0 39.8	5.80	0.9569277	0.9685230	0.9699981
28	113 6 15.5	2 13.53	1.4	0 1 3.0	5.80	0.9569485	0.9714523	0.9728842
May 2	113 15 9.6	2 13.52	+ 2.0	+0 1 26.2	+5.80	0.9569694	0.9742928	0.9756770
6	113 24 3.7	2 13.51	2.5	0 1 49.4	5.80	0.9569905	0.9770360	0.9783691
10	113 32 57.7	2 13.49	3.0	0 2 12.7	5.80	0.9570117	0.9796753	0.9809539
14	113 41 51.7	2 13.48	3.5	0 2 35.8	5.80	0.9570330	0.9822038	0.9834241
18	113 50 45.6	2 13.47	4.0	0 2 59.0	5.80	0.9570545	0.9846142	0.9857733
22	113 59 39.5	2 13.46	+ 4.5	+0 3 22.2	+5.80	0.9570761	0.9869004	0.9879947
26	114 8 33.3	2 13.44	5.0	0 3 45.4	5.80	0.9570979	0.9890555	0.9900821
30	114 17 27.0	2 13.43	5.5	0 4 8.6	5.80	0.9571198	0.9910742	0.9920311
June 3	114 26 20.7	2 13.41	6.0	0 4 31.8	5.80	0.9571419	0.9929526	0.9938381
7	114 35 14.4	2 13.40	6.5	0 4 55.0	5.80	0.9571641	0.9946874	0.9955001
11	114 44 8.0	2 13.39	+ 7.0	+0 5 18.2	+5.79	0.9571864	0.9962758	0.9970140
15	114 53 1.5	2 13.37	7.5	0 5 41.4	5.79	0.9572089	0.9977144	0.9983763
19	115 1 55.0	2 13.36	8.0	0 6 4.6	5.79	0.9572315	0.9989996	0.9995836
23	115 10 48.4	2 13.34	8.5	0 6 27.7	5.79	0.9572543	1.0001282	1.0006329
27	115 19 41.7	2 13.32	9.0	0 6 50.9	5.79	0.9572772	1.0010977	1.0015222
July 1	115 28 35.0	2 13.31	+ 9.5	+0 7 14.1	+5.79	0.9573002	1.0019066	1.0022509
5	115 37 28.2	2 13.30	+10.0	+0 7 37.2	+5.79	0.9573234	1.0025549	1.0028185

SATURN.

GREENWICH MEAN NOON.

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	° ′ ″	′ ″	″	° ′ ″	″			
July 1	115 28 35.0	2 13.31	+ 9.5	+0 7 14.1	+5.79	0.9573002	1.0019066	1.0022509
5	115 37 28.2	2 13.30	10.0	0 7 37.2	5.79	0.9573234	1.0025549	1.0028185
9	115 46 21.4	2 13.28	10.5	0 8 0.3	5.78	0.9573467	1.0030416	1.0032241
13	115 55 14.5	2 13.26	11.0	0 8 23.5	5.78	0.9573701	1.0033657	1.0034662
17	116 4 7.5	2 13.25	11.5	0 8 46.6	5.78	0.9573937	1.0035256	1.0035435
21	116 13 0.5	2 13.23	+12.0	+0 9 9.7	+5.78	0.9574174	1.0035201	1.0034555
25	116 21 53.4	2 13.22	12.5	0 9 32.9	5.78	0.9574413	1.0033496	1.0032023
29	116 30 46.3	2 13.21	13.0	0 9 56.0	5.78	0.9574653	1.0030139	1.0027847
Aug. 2	116 39 39.1	2 13.19	13.5	0 10 19.1	5.78	0.9574894	1.0025148	1.0022046
6	116 48 31.8	2 13.17	14.0	0 10 42.2	5.77	0.9575137	1.0018539	1.0014627
10	116 57 24.5	2 13.16	+14.5	+0 11 5.3	+5.77	0.9575381	1.0010313	1.0005599
14	117 6 17.1	2 13.14	15.0	0 11 28.4	5.77	0.9575627	1.0000485	0.9994969
18	117 15 9.6	2 13.13	15.5	0 11 51.4	5.77	0.9575873	0.9989055	0.9982747
22	117 24 2.1	2 13.11	16.0	0 12 14.5	5.77	0.9576122	0.9976049	0.9968963
26	117 32 54.6	2 13.10	16.5	0 12 37.6	5.77	0.9576371	0.9961494	0.9953648
30	117 41 46.9	2 13.08	+17.0	+0 13 0.7	+5.76	0.9576622	0.9945428	0.9936840
Sept. 3	117 50 39.2	2 13.06	17.5	0 13 23.7	5.76	0.9576874	0.9927888	0.9918577
7	117 59 31.4	2 13.04	18.0	0 13 46.7	5.76	0.9577128	0.9908910	0.9898892
11	118 8 23.6	2 13.03	18.5	0 14 9.8	5.76	0.9577383	0.9888527	0.9877821
15	118 17 15.7	2 13.02	19.0	0 14 32.8	5.75	0.9577639	0.9866780	0.9855409
19	118 26 7.7	2 13.00	+19.5	+0 14 55.8	+5.75	0.9577897	0.9843718	0.9831714
23	118 34 59.7	2 12.98	20.0	0 15 18.8	5.75	0.9578156	0.9819408	0.9806808
27	118 43 51.6	2 12.96	20.5	0 15 41.8	5.75	0.9578416	0.9793924	0.9780767
Oct. 1	118 52 43.4	2 12.95	20.9	0 16 4.8	5.74	0.9578677	0.9767346	0.9753669
5	119 1 35.2	2 12.93	21.4	0 16 27.8	5.74	0.9578940	0 9739745	0.9725584
9	119 10 26.9	2 12.91	+21.9	+0 16 50.8	+5.74	0.9579205	0.9711199	0.9696600
13	119 19 18.5	2 12.89	22.4	0 17 13.7	5.74	0.9579470	0.9681800	0.9666809
17	119 28 10.1	2 12.88	22.9	0 17 36.7	5.74	0.9579737	0.9651644	0.9636320
21	119 37 1.6	2 12.86	23.4	0 17 59.6	5.73	0.9580005	0.9620853	0.9605260
25	119 45 53.0	2 12.85	23.9	0 18 22.5	5.73	0.9580275	0.9589558	0.9573762
29	119 54 44.4	2 12.83	+24.4	+0 18 45.5	+5.73	0.9580546	0.9557888	0.9541954
Nov. 2	120 3 35.7	2 12.81	24.9	0 19 8.4	5.73	0.9580818	0.9525975	0.9509968
6	120 12 26.9	2 12.80	25.4	0 19 31.3	5.72	0.9581092	0.9493952	0.9477944
10	120 21 18.1	2 12.78	25.9	0 19 54.2	5.72	0.9581367	0.9461966	0.9446036
14	120 30 9.2	2 12.76	26.4	0 20 17.1	5.72	0.9581643	0.9430178	0.9414415
18	120 39 0.2	2 12.74	+26.8	+0 20 39.9	+5.72	0.9581921	0.9398769	0.9383261
22	120 47 51.2	2 12.72	27.3	0 21 2.8	5.71	0.9582199	0.9367916	0.9352757
26	120 56 42.0	2 12.71	27.8	0 21 25.6	5.71	0.9582479	0.9337804	0.9323079
30	121 5 32.9	2 12.69	28.3	0 21 48.5	5.71	0.9582761	0.9308605	0.9294403
Dec. 4	121 14 23.6	2 12.67	28.7	0 22 11.3	5 70	0.9583043	0.9280495	0.9266902
8	121 23 14.3	2 12.65	+29.2	+0 22 34.1	+5.70	0.9583327	0.9253648	0.9240757
12	121 32 4.8	2 12.64	29.7	0 22 56.9	5.70	0.9583613	0.9228254	0.9216162
16	121 40 55.4	2 12.62	30.2	0 23 19.7	5.69	0.9583899	0.9204503	0.9193302
20	121 49 45.8	2 12.60	30.6	0 23 42.4	5.69	0.9584187	0.9182577	0.9172351
24	121 58 36.2	2 12.58	31.1	0 24 5.2	5.69	0.9584476	0.9162641	0.9153464
28	122 7 26.5	2 12.57	+31.6	+0 24 28.0	+5.68	0.9584766	0.9144837	0.9136777
32	122 16 16.7	2 12.55	+32.1	+0 24 50.7	+5.68	0.9585058	0.9129297	0.9122413

URANUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	″	″	° ′ ″	″			
Jan. 6	189 22 25.3	46.42	−7.4	+0 41 43.4	−0.27	1.2634065	1.2613664	1.2597344
14	189 28 36.6	46.42	7.4	0 41 41.2	0.27	1.2634188	1.2581111	1.2565046
22	189 34 48.0	46.42	7.4	0 41 39.0	0.27	1.2634312	1.2549230	1.2533754
30	189 40 59.4	46.42	7.4	0 41 36.8	0.28	1.2634436	1.2518704	1.2504165
Feb. 7	189 47 10.7	46.41	7.5	0 41 34.6	0.28	1.2634561	1.2490214	1.2476927
15	189 53 22.0	46.41	−7.5	+0 41 32.4	−0.28	1.2634686	1.2464370	1.2452622
23	189 59 33.3	46.41	7.5	0 41 30.2	0.28	1.2634811	1.2441756	1.2431838
Mar. 3	190 5 44.5	46.41	7.5	0 41 28.0	0.28	1.2634937	1.2422927	1.2415071
11	190 11 55.7	46.40	7.5	0 41 25.7	0.28	1.2635064	1.2408311	1.2402683
19	190 18 6.9	46.40	7.6	0 41 23.5	0.28	1.2635191	1.2398222	1.2394956
27	190 24 18.1	46.40	−7.6	+0 41 21.2	−0.28	1.2635318	1.2392908	1.2392086
Apr. 4	190 30 29.3	46.39	7.6	0 41 19.0	0.28	1.2635446	1.2392486	1.2394096
12	190 36 40.4	46.39	7.6	0 41 16.7	0.28	1.2635574	1.2396902	1.2400885
20	190 42 51.5	46.39	7.6	0 41 14.4	0.29	1.2635703	1.2406023	1.2412283
28	190 49 2.6	46.38	7.7	0 41 12.1	0.29	1.2635832	1.2419625	1.2427995
May 6	190 55 13.7	46.38	−7.7	+0 41 9.8	−0.29	1.2635962	1.2437336	1.2447590
14	191 1 24.7	46.38	7.7	0 41 7.5	0.29	1.2636092	1.2458703	1.2470614
22	191 7 35.7	46.37	7.7	0 41 5.2	0.29	1.2636223	1.2483258	1.2496560
30	191 13 46.7	46.37	7.7	0 41 2.9	0.29	1.2636354	1.2510448	1.2524839
June 7	191 19 57.7	46.37	7.8	0 41 0.6	0.29	1.2636486	1.2539664	1.2554852
15	191 26 8.6	46.37	−7.8	+0 40 58.2	−0.29	1.2636618	1.2570329	1.2586026
23	191 32 19.5	46.36	7.8	0 40 55.9	0.29	1.2636751	1.2601865	1.2617772
July 1	191 38 30.3	46.36	7.8	0 40 53.5	0.29	1.2636884	1.2633669	1.2649487
9	191 44 41.2	46.36	7.8	0 40 51.2	0.30	1.2637018	1.2665167	1.2680644
17	191 50 52.0	46.35	7.8	0 40 48.8	0.30	1.2637152	1.2695858	1.2710744
25	191 57 2.9	46.35	−7.9	+0 40 46.4	−0.30	1.2637287	1.2725237	1.2739279
Aug. 2	192 3 13.7	46.35	7.9	0 40 44.0	0.30	1.2637422	1.2752819	1.2765811
10	192 9 24.4	46.34	7.9	0 40 41.6	0.30	1.2637558	1.2778209	1.2789972
18	192 15 35.2	46.34	7.9	0 40 39.2	0.30	1.2637694	1.2801049	1.2811397
26	192 21 45.9	46.34	7.9	0 40 36.8	0.30	1.2637830	1.2820975	1.2829753
Sept. 3	192 27 56.6	46.33	−8.0	+0 40 34.4	−0.30	1.2637967	1.2837706	1.2844805
11	192 34 7.2	46.33	8.0	0 40 32.0	0.30	1.2638105	1.2851025	1.2856341
19	192 40 17.8	46.33	8.0	0 40 29.6	0.30	1.2638243	1.2860725	1.2864159
27	192 46 28.4	46.32	8.0	0 40 27.2	0.30	1.2638381	1.2866636	1.2868145
Oct. 5	192 52 39.0	46 32	8.0	0 40 24.7	0.31	1.2638520	1.2868683	1.2868242
13	192 58 49.6	46.32	−8.0	+0 40 22.3	−0.31	1.2638660	1.2866818	1.2864408
21	193 5 0.1	46.31	8.1	0 40 19.8	0.31	1.2638800	1.2861015	1.2856651
29	193 11 10.6	46.31	8.1	0 40 17.3	0.31	1.2638940	1.2851333	1.2845077
Nov. 6	193 17 21.1	46.31	8.1	0 40 14.9	0.31	1.2639081	1.2837903	1.2829828
14	193 23 31.6	46.30	8.1	0 40 12.4	0.31	1.2639222	1.2820874	1.2811072
22	193 29 42.0	46.30	−8.1	+0 40 9.9	−0.31	1.2639364	1.2800458	1.2789075
30	193 35 52.4	46.30	8.1	0 40 7.4	0.31	1.2639506	1.2776969	1.2764183
Dec. 8	193 42 2.8	46.29	8.2	0 40 4.9	0.31	1.2639649	1.2750761	1.2736753
16	193 48 13.1	46.29	8.2	0 40 2.4	0.31	1.2639792	1.2722214	1.2707213
24	193 54 23.4	46.29	8.2	0 39 59.9	0.32	1.2639936	1.2691820	1.2676102
32	194 0 33.7	46.28	−8.2	+0 39 57.3	−0.32	1.2640080	1.2660128	1.2643964
40	194 6 44.0	46.28	−8.2	+0 39 54.8	−0.32	1.2640224	1.2627688	

NEPTUNE.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	″	″	° ′ ″	″			
Jan. –2	56 40 4.2	22.01	–26.6	–1 42 37.6	+0.19	1.4744784	1.4636616	1.4643885
+6	56 43 0.3	22.01	26.6	1 42 36.1	0.19	1.4744786	1.4651645	1.4659853
14	56 45 56.3	22.01	26.7	1 42 34.5	0.19	1.4744788	1.4668465	1.4677441
22	56 48 52.4	22.01	26.8	1 42 33.0	0.19	1.4744790	1.4686728	1.4696274
30	56 51 48.4	22.01	26.8	1 42 31.5	0.19	1.4744792	1.4706029	1.4715939
Feb. 7	56 54 44.5	22.01	–26.9	–1 42 29.9	+0.19	1.4744794	1.4725957	1.4736031
15	56 57 40.6	22.01	27.0	1 42 28.4	0.19	1.4744796	1.4746115	1.4756161
23	57 0 36.7	22.01	27.1	1 42 26.9	0.19	1.4744798	1.4766120	1.4775940
Mar. 3	57 3 32.7	22.01	27.1	1 42 25.3	0.19	1.4744800	1.4785580	1.4794991
11	57 6 28.7	22.01	27.2	1 42 23.8	0.19	1.4744803	1.4804138	1.4812981
19	57 9 24.8	22.01	–27.3	–1 42 22.2	+0.20	1.4744805	1.4821485	1.4829613
27	57 12 20.9	22.01	27.4	1 42 20.7	0.20	1.4744808	1.4837333	1.4844605
Apr. 4	57 15 16.9	22.01	27.4	1 42 19.1	0.20	1.4744811	1.4851410	1.4857721
12	57 18 12.9	22.01	27.5	1 42 17.5	0.20	1.4744814	1.4863518	1.4868776
20	57 21 21.9	22.01	27.5	1 42 15.9	0.20	1.4744817	1.4873479	1.4877605
28	57 24 5.0	22.01	–27.6	–1 42 14.4	+0.20	1.4744820	1.4881144	1.4884079
May 6	57 27 1.1	22.01	27.7	1 42 12.8	0.20	1.4744823	1.4886409	1.4888128
14	57 29 57.1	22.01	27.8	1 42 11.2	0.20	1.4744826	1.4889228	1.4889708
22	57 32 53.1	22.01	27.8	1 42 9.6	0.20	1.4744829	1.4889566	1.4888798
30	57 35 49.1	22.01	27.9	1 42 8.0	0.20	1.4744833	1.4887414	1.4885422
June 7	57 38 45.2	22.01	–28.0	–1 42 6.4	+0.20	1.4744836	1.4882831	1.4879651
15	57 41 41.2	22.01	28.0	1 42 4.8	0.20	1.4744840	1.4875894	1.4871567
23	57 44 37.2	22.01	28.1	1 42 3.2	0.20	1.4744844	1.4866693	1.4861288
July 1	57 47 33.2	22.00	28.2	1 42 1.6	0.20	1.4744848	1.4855376	1.4848981
9	57 50 29.2	22.00	28.3	1 42 0.0	0.20	1.4744852	1.4842126	1.4834833
17	57 53 25.3	22.00	–28.3	–1 41 58.3	+0.20	1.4744856	1.4827133	1.4819049
25	57 56 21.3	22.00	28.4	1 41 56.7	0.20	1.4744860	1.4810620	1.4801880
Aug. 2	57 59 17.2	22.00	28.5	1 41 55.1	0.20	1.4744864	1.4792866	1.4783614
10	58 2 13.3	22.00	28.5	1 41 53.4	0.21	1.4744869	1.4774160	1.4764540
18	58 5 9.3	22.00	28.6	1 41 51.8	0.21	1.4744873	1.4754797	1.4744976
26	58 8 5.3	22.00	–28.7	–1 41 50.2	+0.21	1.4744878	1.4735123	1.4725284
Sept. 3	58 11 1.3	22.00	28.7	1 41 48.5	0.21	1.4744883	1.4715502	1.4705821
11	58 13 57.2	22.00	28.8	1 41 46.9	0.21	1.4744887	1.4696288	1.4686947
19	58 16 53.3	22.00	28.9	1 41 45.2	0.21	1.4744892	1.4677849	1.4669043
27	58 19 49.3	22.00	29.0	1 41 43.5	0.21	1.4744897	1.4660574	1.4652488
Oct. 5	58 22 45.3	22.00	–29.0	–1 41 41.9	+0.21	1.4744902	1.4644824	1.4637622
13	58 25 41.3	22.00	29.1	1 41 40.2	0.21	1.4744908	1.4630924	1.4624772
21	58 28 37.2	22.00	29.2	1 41 38.5	0.21	1.4744913	1.4619201	1.4614251
29	58 31 33.2	22.00	29.2	1 41 36.8	0.21	1.4744919	1.4609942	1.4606304
Nov. 6	58 34 29.2	22.00	29.3	1 41 35.1	0.21	1.4744924	1.4603355	1.4601118
14	58 37 25.2	22.00	–29.4	–1 41 33.5	+0.21	1.4744930	1.4599607	1.4598843
22	58 40 21.2	22.00	29.4	1 41 31.8	0.21	1.4744936	1.4598822	1.4599550
30	58 43 17.1	22.00	29.5	1 41 30.1	0.21	1.4744941	1.4601018	1.4603223
Dec. 8	58 46 13.1	22.00	29.6	1 41 28.4	0.21	1.4744947	1.4606150	1.4609791
16	58 49 9.1	22.00	29.7	1 41 26.7	0.21	1.4744954	1.4614120	1.4619120
24	58 52 5.1	22.00	–29.7	–1 41 24.9	+0.21	1.4744960	1.4624753	1.4630989
32	58 55 1.0	22.00	–29.8	–1 41 23.2	+0.22	1.4744966	1.4637789	

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Jan. 1	+0.1846360	+0.1932195	+378	−0.8860072	−0.8844628	+227	−0.3843577	−0.3836881	−342
2	0.2017874	0.2103392	369	0.8828495	0.8811676	231	0.3829885	0.3822592	338
3	0.2188742	0.2273918	360	0.8794173	0.8775987	235	0.3815001	0.3807115	334
4	0.2358913	0.2443721	351	0.8757120	0.8737574	238	0.3798932	0.3790456	330
5	0.2528337	0.2612753	342	0.8717352	0.8696454	241	0.3781683	0.3772619	326
6	+0.2696965	+0.2780965	+333	−0.8674884	−0.8652642	+244	−0.3763260	−0.3753612	−322
7	0.2864748	0.2948308	324	0.8629730	0.8606151	246	0.3743671	0.3733442	318
8	0.3031637	0.3114732	315	0.8581905	0.8556997	248	0.3722922	0.3712116	314
9	0.3197584	0.3280189	306	0.8531425	0.8505195	250	0.3701021	0.3689640	310
10	0.3362540	0.3444632	297	0.8478306	0.8450762	251	0.3677973	0.3666022	306
11	+0.3526457	+0.3608012	+288	−0.8422564	−0.8393713	+252	−0.3653786	−0.3641268	−303
12	0.3689289	0.3770283	280	0.8364212	0.8334061	253	0.3628466	0.3615384	299
13	0.3850988	0.3931397	271	0.8303263	0.8271821	253	0.3602020	0.3588378	295
14	0.4011504	0.4091305	262	0.8239736	0.8207012	253	0.3574456	0.3560258	291
15	0.4170790	0.4249958	253	0.8173650	0.8139654	253	0.3545782	0.3531033	287
16	+0.4328800	+0.4407309	+245	−0.8105024	−0.8069764	+253	−0.3516008	−0.3500711	−283
17	0.4485481	0.4563306	236	0.8033873	0.7997358	253	0.3485140	0.3469299	279
18	0.4640780	0.4717895	228	0.7960217	0.7922457	252	0.3453186	0.3436805	275
19	0.4794645	0.4871025	220	0.7884078	0.7845084	251	0.3420156	0.3403240	271
20	0.4947029	0.5022650	212	0.7805477	0.7765260	250	0.3386060	0.3368614	267
21	+0.5097884	+0.5172722	+204	−0.7724436	−0.7683010	+249	−0.3350907	−0.3332938	−263
22	0.5247160	0.5321190	196	0.7640983	0.7598361	247	0.3314709	0.3296222	259
23	0.5394805	0.5468001	188	0.7555145	0.7511340	245	0.3277478	0.3258479	255
24	0.5540769	0.5613107	180	0.7466948	0.7421975	243	0.3239225	0.3219720	250
25	0.5685007	0.5756464	172	0.7376423	0.7330298	240	0.3199962	0.3179957	246
26	+0.5827472	+0.5898025	+165	−0.7283604	−0.7236342	+237	−0.3159703	−0.3139205	−242
27	0.5968117	0.6037743	157	0.7188518	0.7140140	234	0.3118463	0.3097479	238
28	0.6106897	0.6175574	150	0.7091208	0.7041728	231	0.3076256	0.3054794	233
29	0.6243767	0.6311475	143	0.6991705	0.6941140	228	0.3033096	0.3011163	229
30	0.6378688	0.6445405	136	0.6890039	0.6838407	224	0.2988998	0.2966602	224
31	+0.6511620	+0.6577328	+129	−0.6786246	−0.6733566	+221	−0.2943977	−0.2921126	−220
Feb. 1	0.6642526	0.6707208	123	0.6680367	0.6626656	217	0.2898049	0.2874750	215
2	0.6771371	0.6835009	117	0.6572437	0.6517712	213	0.2851228	0.2827489	210
3	0.6898119	0.6960694	111	0.6462488	0.6406769	209	0.2803531	0.2779360	206
4	0.7022733	0.7084229	105	0.6350558	0.6293863	205	0.2754974	0.2730378	202
5	+0.7145180	+0.7205580	+ 99	−0.6236685	−0.6179032	+201	−0.2705572	−0.2680559	−198
6	0.7265426	0.7324714	93	0.6120904	0.6062310	197	0.2655340	0.2629919	194
7	0.7383439	0.7441599	88	0.6003251	0.5943733	192	0.2604295	0.2578473	190
8	0.7499188	0.7556204	82	0.5883759	0.5823334	187	0.2552451	0.2526236	186
9	0.7612642	0.7668498	77	0.5762462	0.5701149	182	0.2499826	0.2473225	182
10	+0.7723768	+0.7778447	+ 72	−0.5639397	−0.5577213	+177	−0.2446433	−0.2419454	−178
11	0.7832532	0.7886019	67	0.5514600	0.5451563	172	0.2392288	0.2364940	174
12	0.7938903	0.7991182	62	0.5388106	0.5324235	167	0.2337409	0.2309700	170
13	0.8042851	0.8093907	58	0.5259952	0.5195265	161	0.2281812	0.2253749	165
14	0.8144345	0.8194162	53	0.5130175	0.5064690	156	0.2225512	0.2197104	161
15	+0.8243353	+0.8291915	+ 49	−0.4998813	−0.4932550	+150	−0.2168526	−0.2139781	−157

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Feb. 15	+0.8243353	+0.8291915	+49	−0.4998813	−0.4932550	+150	−0.2168526	−0.2139781	−157
16	0.8339843	0.8387134	45	0.4865905	0.4798884	144	0.2110670	0.2081797	153
17	0.8433782	0.8479785	41	0.4731490	0.4663731	138	0.2052561	0.2023169	149
18	0.8525138	0.8569838	37	0.4595608	0.4527132	133	0.1993618	0.1963916	145
19	0.8613881	0.8657262	34	0.4458304	0.4389134	127	0.1934060	0.1904057	141
20	+0.8699983	+0.8742037	+30	−0.4319625	−0.4249784	+121	−0.1873906	−0.1843612	−137
21	0.8783419	0.8824124	27	0.4179616	0.4109125	115	0.1813175	0.1782599	133
22	0.8864157	0.8903512	24	0.4038318	0.3967200	109	0.1751885	0.1721037	129
23	0.8942184	0.8980167	21	0.3895778	0.3824057	103	0.1690056	0.1658946	125
24	0.9017462	0.9054067	18	0.3752044	0.3679744	97	0.1627708	0.1596348	120
25	+0.9089978	+0.9125193	+16	−0.3607164	−0.3534310	+ 91	−0.1564864	−0.1533263	−116
26	0.9159709	0.9193524	14	0.3461188	0.3387805	85	0.1501543	0.1469711	112
27	0.9226634	0.9259040	12	0.3314166	0.3240278	79	0.1437767	0.1405715	108
28	0.9290736	0.9321725	10	0.3166146	0.3091776	73	0.1373557	0.1341295	104
Mar. 1	0.9352002	0.9381568	8	0.3017174	0.2942347	67	0.1308933	0.1276471	99
2	+0.9410420	+0.9438557	+ 6	−0.2867299	−0.2792038	+ 61	−0.1243914	−0.1211264	− 95
3	0.9465978	0.9492681	5	0.2716568	0.2640897	55	0.1178523	0.1145695	91
4	0.9518666	0.9543930	3	0.2565029	0.2488970	49	0.1112780	0.1079783	87
5	0.9568472	0.9592293	2	0.2412727	0.2336304	43	0.1046704	0.1013548	83
6	0.9615388	0.9637759	+ 1	0.2259708	0.2182944	37	0.0980316	0.0947012	79
7	+0.9659404	+0.9680321	0	−0.2106018	−0.2028935	+ 31	−0.0913637	−0.0880195	− 75
8	0.9700510	0.9719970	− 1	0.1951702	0.1874323	25	0.0846686	0.0813115	71
9	0.9738699	0.9756699	2	0.1796804	0.1719151	18	0.0779482	0.0745792	67
10	0.9773965	0.9790501	2	0.1641368	0.1563462	12	0.0712045	0.0678246	63
11	0.9806301	0.9821367	2	0.1485437	0.1407299	+ 6	0.0644395	0.0610496	59
12	+0.9835697	+0.9849289	− 2	−0.1329054	−0.1250706	0	−0.0576549	−0.0542560	− 55
13	0.9862144	0.9874259	3	0.1172262	0.1093727	− 6	0.0508527	0.0474457	52
14	0.9885636	0.9896271	3	0.1015106	0.0936406	12	0.0440349	0.0406208	48
15	0.9906166	0.9915319	3	0.0857632	0.0778790	18	0.0372035	0.0337833	44
16	0.9923729	0.9931396	3	0.0699886	0.0620926	24	0.0303604	0.0269352	40
17	+0.9938318	+0.9944495	− 2	−0.0541916	−0.0462861	− 30	−0.0235078	−0.0200786	− 36
18	0.9949927	0.9954612	2	0.0383768	0.0304643	36	0.0166476	0.0132155	32
19	0.9958551	0.9961742	− 1	0.0225491	−0.0146320	42	0.0097820	−0.0063479	28
20	0.9964185	0.9965880	0	−0.0067135	+0.0012059	48	−0.0029129	+0.0005222	24
21	0.9966826	0.9967024	+ 1	+0.0091254	0.0170446	54	+0.0039576	0.0073927	20
22	+0.9966473	+0.9965176	+ 2	+0.0249628	+0.0328790	− 60	+0.0108274	+0.0142613	− 16
23	0.9963131	0.9960340	3	0.0407932	0.0487040	66	0.0176942	0.0211257	12
24	0.9956803	0.9952521	4	0.0566114	0.0645144	72	0.0245558	0.0279839	8
25	0.9947493	0.9941721	6	0.0724126	0.0803052	78	0.0314101	0.0348337	− 4
26	0.9935204	0.9927944	7	0.0881918	0.0960714	84	0.0382549	0.0416730	0
27	+0.9919942	+0.9911199	+ 9	+0.1039438	+0.1118082	− 90	+0.0450881	+0.0484997	+ 4
28	0.9901718	0.9891498	11	0.1196639	0.1275106	96	0.0519076	0.0553116	8
29	0.9880543	0.9868853	13	0.1353475	0.1431739	101	0.0587114	0.0621067	12
30	0.9856431	0.9843278	15	0.1509895	0.1587931	107	0.0654973	0.0688828	16
31	0.9829395	0.9814785	18	0.1665847	0.1743635	113	0.0722631	0.0756378	20
32	+0.9799448	+0.9783387	+20	+0.1821288	+0.1898806	−119	+0.0790069	+0.0823699	+ 24

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Apr. 1	+0.9799448	+0.9783387	+ 20	+0.1821238	+0.1898806	−119	+0.0790069	+0.0823699	+ 24
2	0.9766603	0.9749100	23	0.1976177	0.2053403	124	0.0857268	0.0890772	28
3	0.9730878	0.9711941	26	0.2130472	0.2207383	130	0.0924210	0.0957578	32
4	0.9692290	0.9671927	29	0.2284127	0.2360702	136	0.0990875	0.1024097	36
5	0.9650855	0.9629074	32	0.2437099	0.2513317	142	0.1057243	0.1090310	40
6	+0.9606586	+0.9583395	+ 35	+0.2589348	+0.2665189	−147	+0.1123297	+0.1156201	+ 44
7	0.9559500	0.9534907	38	0.2740833	0.2816276	153	0.1189020	0.1221751	48
8	0.9509615	0.9483629	42	0.2891513	0.2966539	159	0.1254392	0.1286942	52
9	0.9456948	0.9429577	45	0.3041349	0.3115936	165	0.1319396	0.1351755	56
10	0.9401516	0.9372767	49	0.3190298	0.3264426	170	0.1384014	0.1416173	60
11	+0.9343333	+0.9313214	+ 53	+0.3338320	+0.3411971	−176	+0.1448229	+0.1480180	+ 64
12	0.9282413	0.9250933	57	0.3485378	0.3558532	181	0.1512024	0.1543758	68
13	0.9218774	0.9185942	61	0.3631431	0.3704067	187	0.1575381	0.1606889	72
14	0.9152435	0.9118261	65	0.3776436	0.3848532	192	0.1638281	0.1669554	76
15	0.9083416	0.9047907	69	0.3920349	0.3991884	197	0.1700706	0.1731735	80
16	+0.9011734	+0.8974899	+ 74	+0.4063128	+0.4134080	−202	+0.1762639	+0.1793415	+ 84
17	0.8937406	0.8899257	79	0.4204732	0.4275080	207	0.1824061	0.1854575	88
18	0.8860455	0.8821004	84	0.4345117	0.4414840	212	0.1884955	0.1915198	92
19	0.8780906	0.8740164	89	0.4484242	0.4553319	217	0.1945302	0.1975265	96
20	0.8698781	0.8656760	95	0.4622064	0.4690473	222	0.2005085	0.2034759	100
21	+0.8614105	+0.8570818	+100	+0.4758540	+0.4826259	−227	+0.2064286	+0.2093661	+104
22	0.8526904	0.8482366	106	0.4893626	0.4960634	231	0.2122884	0.2151951	107
23	0.8437207	0.8391434	112	0.5027280	0.5093558	236	0.2180861	0.2209612	111
24	0.8345046	0.8298051	118	0.5159464	0.5224992	240	0.2238202	0.2266629	115
25	0.8250453	0.8202254	124	0.5290138	0.5354895	245	0.2294890	0.2322984	119
26	+0.8153459	+0.8104073	+130	+0.5419260	+0.5483228	−249	+0.2350907	+0.2378660	+123
27	0.8054098	0.8003542	136	0.5546793	0.5609956	253	0.2406237	0.2433640	127
28	0.7952405	0.7900696	143	0.5672708	0.5735047	257	0.2460864	0.2487910	131
29	0.7848414	0.7795569	149	0.5796970	0.5858468	261	0.2514774	0.2541455	135
30	0.7742160	0.7688196	156	0.5919540	0.5980182	265	0.2567952	0.2594261	139
May 1	+0.7633677	+0.7578612	+163	+0.6040385	+0.6100153	−269	+0.2620382	+0.2646314	+143
2	0.7523001	0.7466852	170	0.6159475	0.6218355	272	0.2672052	0.2697599	147
3	0.7410167	0.7352953	177	0.6276784	0.6334761	276	0.2722949	0.2748103	151
4	0.7295212	0.7236951	185	0.6392281	0.6449341	279	0.2773059	0.2797814	155
5	0.7178171	0.7118880	192	0.6505936	0.6562066	282	0.2822368	0.2846719	159
6	+0.7059078	+0.6998774	+200	+0.6617723	+0.6672907	−284	+0.2870865	+0.2894806	+163
7	0.6937968	0.6876668	208	0.6727613	0.6781838	287	0.2918538	0.2942063	167
8	0.6814876	0.6752597	216	0.6835579	0.6888832	289	0.2965376	0.2988478	172
9	0.6689835	0.6626594	224	0.6941593	0.6993860	292	0.3011365	0.3034038	176
10	0.6562879	0.6498693	232	0.7045626	0.7096893	294	0.3056493	0.3078731	180
11	+0.6434040	+0.6368925	+240	+0.7147652	+0.7197906	−296	+0.3100749	+0.3122547	+184
12	0.6303352	0.6237327	249	0.7247647	0.7296874	297	0.3144122	0.3165474	188
13	0.6170852	0.6103935	257	0.7345582	0.7393767	299	0.3186600	0.3207500	192
14	0.6036577	0.5968786	266	0.7441425	0.7488553	300	0.3228170	0.3248612	196
15	0.5900564	0.5831917	275	0.7535146	0.7581203	302	0.3268821	0.3288798	200
16	+0.5762849	+0.5693366	+284	+0.7626717	+0.7671690	−303	+0.3308540	+0.3328046	+205

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
May 16	+0.5762849	+0.5693366	+284	+0.7626717	+0.7671690	–303	+0.3308540	+0.3328046	+205
17	0.5623471	0.5553171	293	0.7716113	0.7759987	303	0.3347314	0.3366344	209
18	0.5482469	0.5411372	302	0.7803304	0.7846067	304	0.3385132	0.3403681	213
19	0.5339885	0.5268013	311	0.7888265	0.7929903	305	0.3421985	0.3440046	217
20	0.5195762	0.5123137	320	0.7970972	0.8011471	305	0.3457861	0.3475429	221
21	+0.5050143	+0.4976787	+329	+0.8051396	+0.8090743	–305	+0.3492748	+0.3509817	+225
22	0.4903074	0.4829010	339	0.8129510	0.8167695	304	0.3526635	0.3543200	229
23	0.4754601	0.4679852	348	0.8205293	0.8242305	303	0.3559511	0.3575568	233
24	0.4604769	0.4529358	358	0.8278726	0.8314554	302	0.3591369	0.3606914	237
25	0.4453624	0.4377575	367	0.8349788	0.8384423	301	0.3622201	0.3637228	241
26	+0.4301215	+0.4224552	+377	+0.8418458	+0.8451891	–299	+0.3651997	+0.3666502	+245
27	0.4147591	0.4070336	387	0.8484719	0.8516942	297	0.3680748	0.3694729	249
28	0.3992796	0.3914976	397	0.8548557	0.8579563	295	0.3708448	0.3721902	254
29	0.3836881	0.3758518	407	0.8609959	0.8639741	293	0.3735092	0.3748015	258
30	0.3679892	0.3601009	417	0.8668910	0.8697463	291	0.3760672	0.3773061	262
31	+0.3521874	+0.3442493	+427	+0.8725398	+0.8752716	–288	+0.3785182	+0.3797034	+266
June 1	0.3362872	0.3283016	437	0.8779413	0.8805490	285	0.3808618	0.3819931	271
2	0.3202931	0.3122623	447	0.8830942	0.8855772	282	0.3830975	0.3841747	275
3	0.3042097	0.2961360	457	0.8879974	0.8903551	278	0.3852249	0.3862478	279
4	0.2880416	0.2799271	467	0.8926499	0.8948818	274	0.3872434	0.3882117	283
5	+0.2717930	+0.2636398	+477	+0.8970507	+0.8991565	–270	+0.3891525	+0.3900659	+287
6	0.2554681	0.2472783	487	0.9011991	0.9031784	265	0.3909518	0.3918102	291
7	0.2390710	0.2308468	497	0.9050942	0.9069464	259	0.3926410	0.3934443	295
8	0.2226061	0.2143497	507	0.9087348	0.9104593	254	0.3942199	0.3949678	299
9	0.2060778	0.1977915	516	0.9121198	0.9137163	248	0.3956879	0.3963802	303
10	+0.1894907	+0.1811766	+526	+0.9152485	+0.9167164	–242	+0.3970445	+0.3976810	+307
11	0.1728492	0.1645094	535	0.9181197	0.9194585	235	0.3982893	0.3988697	311
12	0.1561575	0.1477943	545	0.9207324	0.9219417	229	0.3994221	0.3999462	315
13	0.1394202	0.1310360	554	0.9230858	0.9241650	222	0.4004424	0.4009102	319
14	0.1226421	0.1142392	563	0.9251788	0.9261274	215	0.4013498	0.4017611	323
15	+0.1058278	+0.0974086	+572	+0.9270105	+0.9278281	–208	+0.4021439	+0.4024984	+327
16	0.0889819	0.0805489	581	0.9285800	0.9292662	200	0.4028245	0.4031221	331
17	0.0721095	0.0636651	590	0.9298867	0.9304413	192	0.4033913	0.4036319	336
18	0.0552158	0.0467625	599	0.9309301	0.9313529	184	0.4038439	0.4040274	340
19	0.0383057	0.0298461	607	0.9317098	0.9320006	175	0.4041822	0.4043086	344
20	+0.0213842	+0.0129208	+616	+0.9322254	+0.9323841	–166	+0.4044062	+0.4044753	+348
21	+0.0044564	–0.0040083	624	0.9324767	0.9325032	156	0.4045157	0.4045275	352
22	–0.0124728	0.0209361	632	0.9324637	0.9323581	146	0.4045106	0.4044651	356
23	0.0293980	0.0378574	640	0.9321864	0.9319488	136	0.4043910	0.4042883	360
24	0.0463139	0.0547669	648	0.9316451	0.9312757	126	0.4041570	0.4039971	364
25	–0.0632156	–0.0716596	+656	+0.9308403	+0.9303394	–115	+0.4038086	+0.4035917	+368
26	0.0800982	0.0885307	663	0.9297726	0.9291404	104	0.4033461	0.4030723	372
27	0.0969566	0.1053751	670	0.9284426	0.9276793	92	0.4027698	0.4024391	376
28	0.1137859	0.1221881	677	0.9268508	0.9259570	81	0.4020799	0.4016925	380
29	0.1305815	0.1389653	684	0.9249982	0.9239744	69	0.4012768	0.4008329	383
30	–0.1473392	–0.1557023	+691	+0.9228857	+0.9217324	– 57	+0.4003608	+0.3998606	+387

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
July 1	−0.1640544	−0.1723944	+697	+0.9205145	+0.9192320	− 44	+0.3993323	+0.3987760	+391
2	0.1807221	0.1890368	703	0.9178852	0.9164740	32	0.3981917	0.3975795	395
3	0.1973379	0.2056251	709	0.9149986	0.9134593	19	0.3969394	0.3962715	398
4	0.2138975	0.2221550	714	0.9118558	0.9101890	− 6	0.3955758	0.3948525	402
5	0.2303969	0.2386227	719	0.9084581	0.9066642	+ 7	0.3941014	0.3933228	406
6	−0.2468319	−0.2550239	+724	+0.9048063	+0.9028855	+ 20	+0.3925166	+0.3916830	+410
7	0.2631981	0.2713540	728	0.9009010	0.8988536	34	0.3908219	0.3899335	413
8	0.2794910	0.2876087	732	0.8967431	0.8945697	48	0.3890176	0.3880746	417
9	0.2957064	0.3037837	736	0.8923336	0.8900348	63	0.3871041	0.3861067	420
10	0.3118400	0.3198747	740	0.8876736	0.8852499	77	0.3850820	0.3840304	424
11	−0.3278873	−0.3358772	+743	+0.8827640	+0.8802159	+ 92	+0.3829517	+0.3818461	+427
12	0.3438438	0.3517867	746	0.8776059	0.8749339	107	0.3807136	0.3795543	430
13	0.3597051	0.3675986	749	0.8722003	0.8694049	122	0.3783682	0.3771555	433
14	0.3754665	0.3833083	751	0.8665481	0.8636300	137	0.3759161	0.3746502	436
15	0.3911232	0.3989109	753	0.8606506	0.8576105	153	0.3733578	0.3720390	439
16	−0.4066705	−0.4144018	+755	+0.8545095	+0.8513480	+168	+0.3706939	+0.3693226	+442
17	0.4221039	0.4297764	756	0.8481261	0.8448440	184	0.3679250	0.3665015	445
18	0.4374187	0.4450302	757	0.8415019	0.8381002	200	0.3650519	0.3635765	448
19	0.4526103	0.4601583	758	0.8346388	0.8311185	216	0.3620753	0.3605484	451
20	0.4676738	0.4751561	759	0.8275390	0.8239010	232	0.3589960	0.3574182	454
21	−0.4826046	−0.4900189	+760	+0.8202045	+0.8164499	+248	+0.3558150	+0.3541866	+457
22	0.4973982	0.5047422	758	0.8126374	0.8087673	264	0.3525331	0.3508545	460
23	0.5120501	0.5193216	756	0.8048398	0.8008554	281	0.3491512	0.3474230	463
24	0.5265559	0.5337527	755	0.7968141	0.7927167	297	0.3456703	0.3438931	466
25	0.5409113	0.5480313	753	0.7885632	0.7843541	314	0.3420916	0.3402660	469
26	−0.5551122	−0.5621533	+751	+0.7800898	+0.7757704	+330	+0.3384163	+0.3365428	+472
27	0.5691544	0.5761148	748	0.7713964	0.7669679	347	0.3346454	0.3327245	474
28	0.5830342	0.5899121	745	0.7624855	0.7579493	363	0.3307800	0.3288123	477
29	0.5967482	0.6035419	741	0.7533599	0.7487174	380	0.3268213	0.3248074	479
30	0.6102930	0.6170006	737	0.7440223	0.7392750	396	0.3227705	0.3207110	482
31	−0.6236646	−0.6302842	+733	+0.7344758	+0.7296251	+413	+0.3186289	+0.3165243	+484
Aug. 1	0.6368590	0.6433888	728	0.7247232	0.7197704	429	0.3143976	0.3122487	487
2	0.6498729	0.6563112	723	0.7147671	0.7097134	446	0.3100780	0.3078854	489
3	0.6627031	0.6690484	718	0.7046098	0.6994566	462	0.3056712	0.3034354	491
4	0.6753465	0.6815971	712	0.6942541	0.6890026	479	0.3011782	0.2988997	493
5	−0.6877996	−0 6939537	+706	+0.6837025	+0.6783541	+496	+0.2966001	+0.2942796	+495
6	0.7000589	0.7061148	699	0.6729579	0.6675139	513	0.2919383	0.2895764	497
7	0.7121209	0.7180770	692	0.6620227	0.6564844	530	0.2871940	0.2847913	499
8	0.7239824	0.7298368	685	0.6508995	0.6452683	547	0.2823683	0.2799253	500
9	0.7356398	0.7413908	677	0.6395912	0.6338685	564	0.2774623	0.2749796	502
10	−0.7470896	−0.7527356	+669	+0.6281006	+0.6222879	+580	+0.2724773	+0.2699556	+503
11	0.7583284	0.7638676	661	0.6164307	0.6105295	596	0.2674147	0.2648547	505
12	0.7693527	0.7747832	652	0.6045845	0.5985961	612	0.2622758	0.2596781	506
13	0.7801588	0.7854788	643	0.5925647	0.5864907	628	0.2570618	0.2544270	508
14	0.7907428	0.7959506	633	0.5803745	0.5742166	644	0.2517740	0.2491028	509
15	−0.8011014	−0.8061953	+623	+0.5680174	+0.5617773	+660	+0.2464138	+0.2437071	+510

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Aug. 16	−0.8112315	−0.8162098	+613	+0.5554968	+0.5491763	+ 675	+0.2409828	+0.2382413	+511
17	0.8211297	0.8259907	602	0.5428163	0.5364172	690	0.2354825	0.2327070	512
18	0.8307924	0.8355345	591	0.5299795	0.5235037	705	0.2299146	0.2271058	513
19	0.8402165	0.8448382	580	0.5169903	0.5104399	720	0.2242806	0.2214393	514
20	0.8493991	0.8538990	568	0.5038528	0.4972297	735	0.2185820	0.2157091	515
21	−0.8583373	−0.8627139	+556	+0.4905709	+0.4838771	+ 750	+0.2128207	+0.2099171	+516
22	0.8670282	0.8712801	543	0.4771487	0.4703862	764	0.2069984	0.2040649	516
23	0.8754692	0.8795952	530	0.4635902	0.4567611	778	0.2011168	0.1981544	516
24	0.8836579	0.8876568	517	0.4498994	0.4430059	792	0.1951778	0.1921874	517
25	0.8915919	0.8954627	503	0.4360807	0.4291247	806	0.1891832	0.1861656	517
26	−0.8992690	−0.9030108	+489	+0.4221382	+0.4151217	+ 819	+0.1831347	+0.1800907	+517
27	0.9066875	0.9102991	475	0.4080758	0.4010008	833	0.1770339	0.1739644	517
28	0.9138453	0.9173258	461	0.3938974	0.3867660	846	0.1708826	0.1677887	517
29	0.9207404	0.9240889	447	0.3796071	0.3724215	859	0.1646828	0.1615653	517
30	0.9273710	0.9305865	432	0.3652092	0.3579712	871	0.1584362	0.1552959	516
31	−0.9337352	−0.9368169	+417	+0.3507075	+0.3434191	+ 884	+0.1521444	+0.1489822	+516
Sept. 1	0.9398313	0.9427784	401	0.3361060	0.3287692	896	0.1458094	0.1426262	515
2	0.9456578	0.9484695	385	0.3214088	0.3140255	908	0.1394329	0.1362296	515
3	0.9512131	0.9538884	368	0.3066195	0.2991916	920	0.1330164	0.1297939	514
4	0.9564953	0.9590334	352	0.2917418	0.2842712	932	0.1265617	0.1233207	513
5	−0.9615027	−0.9639028	+335	+0.2767797	+0.2692684	+ 943	+0.1200706	+0.1168120	+512
6	0.9662337	0.9684950	318	0.2617373	0.2541872	954	0.1135447	0.1102694	511
7	0.9706866	0.9728082	301	0.2466185	0.2390316	964	0.1069858	0.1036945	510
8	0.9748596	0.9768406	284	0.2314271	0.2238054	974	0.1003955	0.0970892	509
9	0.9787510	0.9805906	266	0.2161672	0.2085129	984	0.0937756	0.0904553	507
10	−0.9823591	−0.9840564	+248	+0.2008431	+0.1931584	+ 994	+0.0871281	+0.0837947	+506
11	0.9856822	0.9872364	230	0.1854593	0.1777464	1003	0.0804549	0.0771093	504
12	0.9887188	0.9901292	212	0.1700204	0.1622816	1012	0.0737579	0.0704011	502
13	0.9914675	0.9927335	193	0.1545307	0.1467682	1021	0.0670389	0.0636718	500
14	0.9939270	0.9950479	174	0.1389946	0.1312106	1030	0.0602997	0.0569233	498
15	−0.9960960	−0.9970710	+155	+0.1234168	+0.1156137	+1038	+0.0535424	+0.0501578	+496
16	0.9979730	0.9988017	136	0.1078020	0.0999823	1046	0.0467692	0.0433773	494
17	0.9995571	1.0002392	117	0.0921553	0.0843214	1053	0.0399820	0.0365838	492
18	1.0008479	1.0013832	97	0.0764814	0.0686359	1060	0.0331829	0.0297795	490
19	1.0018450	1.0022333	78	0.0607855	0.0529308	1066	0.0263741	0.0229667	487
20	−1.0025480	−1.0027890	+ 58	+0.0450724	+0.0372110	+1073	+0.0195577	+0.0161474	+484
21	1.0029562	1.0030497	38	0.0293471	0.0214814	1079	0.0127358	0.0093236	481
22	1.0030693	1.0030152	+ 18	+0.0136144	+0.0057468	1085	+0.0059106	+0.0024975	478
23	1.0028873	1.0026857	− 3	−0.0021209	−0.0099880	1091	−0.0009158	−0.0043288	475
24	1.0024104	1.0020616	23	0.0178541	0.0257185	1096	0.0077415	0.0111534	472
25	−1.0016392	−1.0011433	− 44	−0.0335807	−0.0414400	+1101	−0.0145645	−0.0179743	+468
26	1.0005740	0.9999312	64	0.0492960	0.0571480	1106	0.0213827	0.0247893	465
27	0.9992151	0.9984257	85	0.0649954	0.0728379	1110	0.0281941	0.0315965	461
28	0.9975631	0.9966272	106	0.0806746	0.0885052	1114	0.0349967	0.0383940	457
29	0.9956183	0.9945363	127	0.0963289	0.1041453	1118	0.0417885	0.0451797	453
30	−0.9933813	−0.9921535	−148	−0.1119537	−0.1197539	+1121	−0.0485675	−0.0519516	+449

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
Oct. 1	–0.9908528	–0.9894794	– 169	–0.1275449	–0.1353268	+1124	–0.0553318	–0.0587079	+445
2	0.9880333	0.9865146	190	0.1430986	0.1508601	1127	0.0620797	0.0654469	441
3	0.9849232	0.9832594	212	0.1586106	0.1663496	1129	0.0688094	0 0721668	436
4	0.9815230	0.9797144	233	0.1740765	0.1817907	1131	0.0755189	0.0788655	432
5	0.9778333	0.9758802	255	0.1894916	0.1971788	1132	0.0822063	0.0855411	427
6	–0.9738549	–0.9717576	– 277	–0.2048516	–0.2125097	+1133	–0.0888696	–0.0921916	+422
7	0.9695884	0.9673472	299	0.2201523	0.2277791	1134	0.0955069	0.0988152	417
8	0.9650344	0.9626496	320	0.2353893	0.2429824	1135	0.1021165	0.1054102	412
9	0.9601934	0.9576656	342	0.2505579	0.2581149	1135	0.1086963	0.1119744	406
10	0.9550665	0.9523961	364	0.2656533	0.2731721	1135	0.1152443	0.1185057	401
11	–0.9496547	–0.9468422	– 386	–0.2806710	–0.2881492	+1134	–0.1217585	–0.1250022	+395
12	0.9439589	0.9410048	408	0.2956062	0.3030414	1133	0.1282369	0.1314620	389
13	0.9379801	0.9348850	430	0.3104541	0.3178439	1132	0.1346775	0.1378830	383
14	0.9317197	0.9284845	452	0.3252100	0.3325520	1131	0.1410783	0.1442631	377
15	0.9251795	0.9218050	474	0.3398691	0.3471608	1129	0.1474372	0.1506002	371
16	–0.9183612	–0.9148482	– 496	–0.3544264	–0.3616655	+1127	–0.1537520	–0.1568922	+365
17	0.9112663	0.9076159	518	0.3688771	0.3760613	1125	0.1600206	0.1631370	358
18	0.9038969	0.9001102	540	0.3832168	0.3903435	1122	0.1662412	0.1693328	352
19	0.8962554	0.8923334	563	0.3974406	0.4045075	1119	0.1724118	0.1754776	345
20	0.8883442	0.8842882	585	0.4115437	0.4185486	1116	0.1785303	0.1815693	338
21	–0.8801658	–0.8759771	– 607	–0.4255217	–0.4324625	+1112	–0.1845946	–0.1876059	+331
22	0.8717226	0.8674025	629	0.4393703	0.4462449	1108	0.1906029	0.1935855	324
23	0.8630173	0.8585672	651	0.4530854	0.4598916	1103	0.1965533	0.1995063	317
24	0.8540527	0.8494741	673	0.4666628	0.4733985	1098	0.2024441	0.2053665	310
25	0.8448317	0.8401259	695	0.4800983	0.4867615	1093	0.2082733	0.2111643	302
26	–0.8353570	–0.8305254	– 717	–0.4933879	–0.4999768	+1087	–0.2140392	–0.2168979	+294
27	0.8256316	0.8206757	739	0.5065278	0.5130405	1081	0.2197401	0.2225657	286
28	0.8156584	0.8105797	761	0.5195143	0.5259489	1075	0.2253744	0.2281660	278
29	0.8054402	0.8002402	783	0.5323438	0.5386984	1068	0.2309404	0.2336973	270
30	0.7949800	0.7896602	805	0.5450124	0.5512852	1061	0.2364366	0.2391579	262
31	–0.7842809	–0.7788426	– 826	–0.5575163	–0.5637055	+1053	–0.2418612	–0.2445462	+254
Nov. 1	0.7733457	0.7677903	848	0.5698521	0.5759560	1045	0.2472127	0.2498606	246
2	0.7621771	0.7565062	870	0.5820165	0.5880333	1037	0.2524896	0.2550996	237
3	0.7507781	0.7449931	892	0.5940058	0.5999336	1029	0.2576904	0.2602617	229
4	0.7391516	0.7332539	913	0.6058163	0.6116533	1020	0.2628135	0.2653454	220
5	–0.7273005	–0.7212916	– 935	–0.6174442	–0.6231886	+1010	–0.2678573	–0.2703490	+211
6	0.7152277	0.7091092	956	0.6288859	0.6345358	1001	0.2728202	0.2752709	202
7	0.7029364	0.6967100	978	0.6401378	0.6456913	991	0.2777007	0.2801095	193
8	0.6904301	0.6840976	999	0.6511959	0.6566510	980	0.2824971	0.2848633	184
9	0.6777125	0.6712755	1020	0.6620563	0.6674112	969	0.2872078	0.2895305	175
10	–0.6647870	–0.6582473	–1041	–0.6727153	–0.6779682	+ 958	–0.2918311	–0.2941096	+165
11	0.6516570	0.6450164	1062	0.6831693	0.6883184	946	0.2963657	0.2985992	156
12	0.6383261	0.6315866	1083	0.6934148	0.6984582	934	0.3008099	0.3029977	146
13	0.6247985	0.6179622	1104	0.7034480	0.7083839	922	0.3051622	0.3073034	137
14	0.6110783	0.6041473	1125	0.7132653	0.7180920	909	0.3094209	0.3115148	127
15	–0.5971697	–0.5901461	–1146	–0.7228633	–0.7275791	+ 896	–0.3135846	–0.3156305	+117

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
Nov. 16	−0.5830771	−0.5759632	−1166	−0.7322388	−0.7368422	+882	−0.3176520	−0.3196492	+107
17	0.5688051	0.5616032	1186	0.7413888	0.7458782	868	0.3216217	0.3235695	97
18	0.5543582	0.5470708	1206	0.7503100	0.7546839	854	0.3254923	0.3273900	87
19	0.5397414	0.5323708	1226	0.7589994	0.7632564	839	0.3292625	0.3311096	77
20	0.5249595	0.5175080	1245	0.7674543	0.7715930	824	0.3329310	0.3347268	66
21	−0.5100171	−0.5024871	−1264	−0.7756719	−0.7796910	+808	−0.3364965	−0.3382404	+ 56
22	0.4949188	0.4873127	1283	0.7836498	0.7875483	792	0.3399580	0.3416495	45
23	0.4796694	0.4719896	1302	0.7913860	0.7951627	775	0.3433145	0.3449532	34
24	0.4642738	0.4565228	1321	0.7988782	0.8025321	758	0.3465653	0.3481507	23
25	0.4487371	0.4409172	1339	0.8061243	0.8096543	740	0.3497093	0.3512409	12
26	−0.4330638	−0.4251775	−1357	−0.8131221	−0.8165272	+722	−0.3527454	−0.3542227	+ 1
27	0.4172587	0.4093082	1375	0.8198696	0.8231489	704	0.3556726	0.3570953	− 10
28	0.4013264	0 3933140	1393	0.8263650	0.8295176	685	0.3584904	0.3598581	21
29	0.3852715	0.3771995	1410	0.8326065	0.8356314	666	0.3611980	0.3625103	32
30	0.3690986	0.3609692	1427	0.8385921	0.8414885	646	0.3637945	0.3650509	43
Dec. 1	−0.3528121	−0.3446277	−1444	−0.8443202	−0.8470871	+626	−0.3662790	−0.3674791	− 54
2	0.3364167	0.3281797	1461	0.8497890	0.8524255	606	0.3686509	0.3697943	65
3	0.3199172	0.3116300	1477	0.8549966	0.8575018	585	0.3709093	0.3719957	76
4	0.3033184	0.2949832	1493	0.8599412	0.8623143	564	0.3730536	0.3740827	87
5	0.2866249	0.2782441	1509	0.8646210	0.8668611	543	0.3750831	0.3760545	98
6	−0.2698414	−0.2614173	−1524	−0.8690343	−0.8711405	+521	−0.3769969	−0.3779102	−110
7	0.2529726	0.2445079	1538	0.8731793	0.8751507	499	0.3787944	0.3796492	121
8	0.2360238	0.2275211	1552	0.8770542	0.8788899	476	0.3804749	0.3812709	133
9	0.2190004	0.2104625	1566	0.8806572	0.8823563	453	0.3820375	0.3827744	144
10	0.2019079	0.1933374	1580	0.8839867	0.8855485	429	0.3834816	0.3841591	156
11	−0.1847514	−0.1761508	−1593	−0.8870415	−0.8884655	+405	−0.3848067	−0.3854245	−167
12	0.1675360	0.1589080	1606	0.8898204	0.8911060	380	0.3860123	0.3865701	179
13	0.1502671	0.1416146	1619	0.8923221	0.8934686	355	0.3870978	0.3875953	191
14	0.1329507	0.1242766	1631	0.8945453	0.8955522	330	0.3880625	0.3884995	203
15	0.1155927	0.1069000	1642	0.8964890	0.8973560	305	0.3889061	0.3892825	214
16	−0.0981989	−0.0894904	−1653	−0.8981528	−0.8988796	+279	−0.3896284	−0.3899441	−226
17	0.0807748	0.0720532	1664	0.8995364	0.9001229	253	0.3902293	0.3904841	238
18	0.0633259	0.0545942	1675	0.9006391	0.9010852	226	0.3907084	0.3909022	250
19	0.0458584	0.0371196	1684	0.9014607	0.9017661	199	0.3910655	0.3911983	262
20	0.0283782	0.0196352	1693	0.9020010	0.9021657	172	0.3913006	0 3913724	273
21	−0.0108909	−0.0021464	−1702	−0.9022600	−0.9022841	+145	−0.3914137	−0.3914245	−285
22	+0.0065980	+0.0153416	1710	0.9022379	0.9021217	117	0.3914047	0.3913546	297
23	0.0240836	0.0328234	1717	0.9019353	0.9016790	89	0.3912738	0.3911628	309
24	0.0415604	0.0502937	1724	0.9013526	0.9009563	60	0.3910212	0.3908494	320
25	0.0590228	0.0677470	1731	0.9004900	0.8999540	31	0.3906472	0.3904147	332
26	+0.0764655	+0.0851780	−1737	−0.8993480	−0.8986727	+ 2	−0.3901519	−0.3898589	−343
27	0.0938835	0.1025816	1742	0.8979277	0.8971132	− 27	0.3895356	0.3891821	355
28	0.1112716	0.1199527	1746	0.8962294	0.8952761	57	0.3887984	0.3883846	366
29	0.1286244	0.1372861	1751	0.8942535	0.8931616	87	0.3879407	0.3874668	378
30	0.1459370	0.1545768	1755	0.8920005	0.8907703	117	0.3869629	0.3864290	390
31	+0.1632047	+0.1718201	−1758	−0.8894711	−0.8881031	−147	−0.3858652	−0.3852715	−402
32	+0.1804225	+0.1890111	−1760	−0.8866663	−0.8851609	−178	−0.3846478	−0.3839945	−414

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JANUARY.		Day of Month.	FEBRUARY.		Day of Month.	MARCH.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	359° 48′ 23″.7	−2° 38′ 15″.4	1.0	44° 2′ 46″.8	−5° 7′ 32″.4	1.0	52° 41 48″.3	+5° 15′ 42″.0
1.5	5 43 41.2	3 4 55.9	1.5	50 16 52.0	5 14 5.3	1.5	58 54 37.9	5 16 59.2
2.0	11 40 52.0	3 29 44.7	2.0	56 36 7.7	5 16 56.9	2.0	65 11 51.1	5 14 30.9
2.5	17 40 36.4	3 52 26.1	2.5	63 1 3.6	5 15 55.7	2.5	71 33 57.5	5 8 10.4
3.0	23 43 33.9	4 12 44.0	3.0	69 32 5.5	5 10 51.6	3.0	78 1 25.3	4 57 52.7
3.5	29 50 22.1	−4 30 22.4	3.5	76 9 34.1	−5 1 36.1	3.5	84 34 40.3	−4 43 34.6
4.0	36 1 36.1	4 45 4.8	4.0	82 53 43.9	4 48 3.9	4.0	91 14 5.9	4 25 15.9
4.5	42 17 47.8	4 56 34.9	4.5	89 44 41.7	4 30 13.3	4.5	97 59 59.9	4 2 59.8
5.0	48 39 24.6	5 4 36.9	5.0	96 42 25.7	4 8 7.2	5.0	104 52 35.4	3 36 53.5
5.5	55 6 48.5	5 8 55.4	5.5	103 46 44.7	3 41 54.2	5.5	111 51 58.1	3 7 9.2
6.0	61 40 15.2	−5 9 16.6	6.0	110 57 17.7	−3 11 49.3	6.0	118 58 5.0	−2 34 4.5
6.5	68 19 53.1	5 5 28.9	6.5	118 13 33.4	2 38 14.4	6.5	126 10 44.1	1 58 3.8
7.0	75 5 42.4	4 57 23.4	7.0	125 34 50.7	2 1 38.6	7.0	133 29 32.3	1 19 37.5
7.5	81 57 35.0	4 44 55.2	7.5	133 0 19.7	1 22 37.9	7.5	140 53 55.5	−0 39 22.7
8.0	88 55 13.8	4 28 4.3	8.0	140 29 2.8	0 41 54.3	8.0	148 23 8.7	+0 1 57.6
8.5	95 58 13.0	−4 6 56.3	8.5	147 59 57.4	−0 0 14.4	8.5	155 56 16.4	+0 43 35.9
9.0	103 5 59.0	3 41 42.9	9.0	155 31 57.3	+0 41 32.3	9.0	163 32 13.8	1 24 41.6
9.5	110 17 51.1	3 12 42.5	9.5	163 3 55.2	1 22 35.6	9.5	171 9 49.0	2 4 23.5
10.0	117 33 3.4	2 40 20.3	10.0	170 34 45.8	2 2 6.8	10.0	178 47 46.0	2 41 51.8
10.5	124 50 46.2	2 5 7.3	10.5	178 3 27.6	2 39 20.6	10.5	186 24 46.9	3 16 20.5
11.0	132 10 7.5	−1 27 40.1	11.0	185 29 5.2	+3 13 36.8	11.0	193 59 35.6	+3 47 9.7
11.5	139 30 16.2	0 48 39.2	11.5	192 50 50.5	3 44 21.5	11.5	201 31 0.9	4 13 46.9
12.0	146 50 22.6	−0 8 47.6	12.0	200 8 3.9	4 11 7.7	12.0	208 57 58.8	4 35 48.2
12.5	154 9 40.9	+0 31 10.5	12.5	207 20 14.9	4 33 35.8	12.5	216 19 35.4	4 52 58.1
13.0	161 27 30.2	1 10 31.5	13.0	214 27 1.7	4 51 33.0	13.0	223 35 7.6	5 5 9.6
13.5	168 43 15.2	+1 48 34.1	13.5	221 28 11.1	+5 4 52.7	13.5	230 44 4.2	+5 12 23.4
14.0	175 56 26.5	2 24 39.6	14.0	228 23 37.9	5 13 34.0	14.0	237 46 6.0	5 14 46.2
14.5	183 6 41.0	2 58 13.8	14.5	235 13 23.4	5 17 40.7	14.5	244 41 4.6	5 12 30.2
15.0	190 13 41.2	3 28 46.8	15.0	241 57 34.9	5 17 20.6	15.0	251 29 1.8	5 5 51.3
15.5	197 17 15.0	3 55 53.8	15.5	248 36 24.0	5 12 44.4	15.5	258 10 8.0	4 55 8.0
16.0	204 17 14.7	+4 19 14.7	16.0	255 10 5.9	+5 4 5.5	16.0	264 44 41.1	+4 40 40.5
16.5	211 13 36.1	4 38 34.4	16.5	261 38 58.5	5 51 39.1	16.5	271 13 4.2	4 22 50.5
17.0	218 6 18.0	4 53 42.4	17.0	268 3 21.2	4 35 42.0	17.0	277 35 45.0	4 1 59.3
17.5	224 55 21.5	5 4 32.3	17.5	274 23 34.4	4 16 31.9	17.5	283 53 13.9	3 38 28.6
18.0	231 40 48.8	5 11 1.9	18.0	280 39 58.9	3 54 27.6	18.0	290 6 3.1	3 12 40.0
18.5	238 22 42.9	+5 13 12.8	18.5	286 52 55.1	+3 29 48.6	18.5	296 14 45.6	+2 44 54.5
19.0	245 1 7.4	5 11 9.5	19.0	293 2 42.8	3 2 54.9	19.0	302 19 54.2	2 15 32.8
19.5	251 36 5.9	5 5 0.0	19.5	299 9 41.4	2 34 6.9	19.5	308 22 1.2	1 44 55.0
20.0	258 7 41.5	4 54 55.2	20.0	305 14 9.2	2 3 45.5	20.0	314 21 37.5	1 13 21.4
20.5	264 35 57.8	4 41 8.1	20.5	311 16 23.4	1 32 11.7	20.5	320 19 12.5	0 41 11.5
21.0	271 0 57.6	+4 23 54.4	21.0	317 16 40.7	+0 59 46.5	21.0	326 15 13.5	+0 8 44.8
21.5	277 22 44.3	4 3 31.4	21.5	323 15 17.0	+0 26 51.0	21.5	332 10 5.9	−0 23 39.6
22.0	283 41 21.1	3 40 18.3	22.0	329 12 27.5	−0 6 14.1	22.0	338 4 12.9	0 55 42.5
22.5	289 56 52.1	3 14 35.7	22.5	335 8 27.6	0 39 8.1	22.5	343 57 55.8	1 27 5.1
23.0	296 9 22.4	2 46 45.0	23.0	341 3 32.3	1 11 31.1	23.0	349 51 33.9	1 57 29.0
23.5	302 18 58.1	+2 17 8.1	23.5	346 57 57.0	−1 43 3.7	23.5	355 45 24.6	−2 26 36.0
24.0	308 25 47.0	1 46 7.5	24.0	352 51 57.7	2 13 27.0	24.0	1 39 43.8	2 54 8.6
24.5	314 29 58.6	1 14 6.1	24.5	358 45 51.1	2 42 23.3	24.5	7 34 46.2	3 19 49.7
25.0	320 31 44.7	0 41 25.3	25.0	4 39 54.8	3 9 35.6	25.0	13 30 45.3	3 43 23.3
25.5	326 31 19.1	+0 8 27.1	25.5	10 34 27.8	3 34 47.6	25.5	19 27 54.3	4 4 34.0
26.0	332 28 58.0	−0 24 27.8	26.0	16 29 50.6	−3 57 44.3	26.0	25 26 25.9	−4 23 7.6
26.5	338 25 0.2	0 56 59.3	26.5	22 26 24.9	4 18 11.3	26.5	31 26 32.9	4 38 50.9
27.0	344 19 46.9	1 28 48.2	27.0	28 24 34.5	4 35 55.2	27.0	37 28 28.5	4 51 31.9
27.5	350 13 41.9	1 59 36.4	27.5	34 24 44.2	4 50 43.5	27.5	43 32 26.8	5 1 0.3
28.0	356 7 11.4	2 29 6.6	28.0	40 27 20.9	5 2 24.5	28.0	49 38 42.9	5 7 6.7
28.5	2 0 43.6	2 57 2.4	28.5	46 32 52.5	−5 10 47.4	28.5	55 47 33.2	5 9 43.6
29.0	7 54 49.1	−3 23 8.2	29.0	52 41 48.3	−5 15 42.0	29.0	61 59 15.5	−5 8 44.9
29.5	13 50 0.5	3 47 8.6	29.5	58 54 37.9	5 16 59.2	29.5	68 14 9.1	5 4 6.0
30.0	19 46 51.7	4 8 49.3	30.0	65 11 51.1	5 14 30.9	30.0	74 32 34.4	4 55 44.3
30.5	25 45 57.8	4 27 56.0	30.5	71 33 57.5	5 8 10.4	30.5	80 54 53.0	4 43 38.9
31.0	31 47 55.0	4 44 14.4	31.0	78 1 25.3	4 57 52.7	31.0	87 21 27.6	4 27 51.2
31.5	37 53 19.4	−4 57 31.1	31.5	84 34 40.3	−4 43 34.6	31.5	93 52 40.5	−4 8 24.8

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	APRIL.		Day of Month.	MAY.		Day of Month.	JUNE.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	100° 28′ 53″.8	−3° 45′ 26″.2	1.0	137° 43′ 46″.4	−0° 37′ 15″.8	1.0	190° 53′ 40″.8	+3° 49′ 16″.1
1.5	107 10 28.0	3 19 5.1	1.5	144 43 10.8	−0 0 15.1	1.5	198 7 4.4	4 12 21.5
2.0	113 57 41.3	2 49 34.8	2.0	151 47 19.3	+0 37 9.8	2.0	205 21 45.6	4 31 27.1
2.5	120 50 48.1	2 17 12.4	2.5	158 56 8.2	1 14 23.0	2.5	212 37 7.4	4 46 11.6
3.0	127 49 57.6	1 42 19.9	3.0	166 9 26.0	1 50 46.2	3.0	219 52 27.4	4 56 19.1
3.5	134 55 12.7	−1 5 24.0	3.5	173 26 52.6	+2 25 39.8	3.5	227 6 59.2	+5 1 39.7
4.0	142 6 27.7	−0 26 56.4	4.0	180 47 58.5	2 58 23.6	4.0	234 19 54.2	5 2 10.2
4.5	149 23 27.8	+0 12 26.3	4.5	188 12 4.4	3 28 18.7	4.5	241 30 23.4	4 57 54.0
5.0	156 45 47.6	0 52 3.0	5.0	195 38 21.5	3 54 48.6	5.0	248 37 39.7	4 49 0.6
5.5	164 12 50.3	1 31 9.2	5.5	203 5 52.9	4 17 20.7	5.5	255 40 59.2	4 35 45.7
6.0	171 43 47.9	+2 8 58.4	6.0	210 33 35.1	+4 35 28.2	6.0	262 39 43.9	+4 18 29.7
6.5	179 17 41.7	2 44 43.6	6.5	218 0 20.8	4 48 51.2	6.5	269 33 22.8	3 57 37.1
7.0	186 53 24.1	3 17 39.5	7.0	225 25 1.8	4 57 17.5	7.0	276 21 32.4	3 33 35.0
7.5	194 29 40.6	3 47 4.9	7.5	232 46 31.8	5 0 42.9	7.5	283 3 57.9	3 6 52.3
8.0	202 5 13.1	4 12 24.1	8.0	240 3 49.4	4 59 11.0	8.0	289 40 32.7	2 37 58.3
8.5	209 38 42.9	+4 33 9.3	8.5	247 16 0.9	+4 52 52.8	8.5	296 11 18.7	+2 7 22.2
9.0	217 8 54.4	4 49 0.9	9.0	254 22 22.3	4 42 5.4	9.0	302 36 25.3	1 35 32.2
9.5	224 34 38.4	4 59 48.3	9.5	261 22 20.2	4 27 10.7	9.5	308 56 8.7	1 2 55.1
10.0	231 54 55.2	5 5 29.7	10.0	268 15 32.9	4 8 33.9	10.0	315 10 51.3	+0 29 55.7
10.5	239 8 56.1	5 6 11.2	10.5	275 1 50.1	3 46 42.7	10.5	321 21 0.4	−0 3 2.9
11.0	246 16 4.9	+5 2 5.5	11.0	281 41 11.9	+3 22 5.4	11.0	327 27 7.5	−0 35 39.5
11.5	253 15 58.4	4 53 30.4	11.5	288 13 48.5	2 55 10.2	11.5	333 29 47.2	1 7 34.7
12.0	260 8 25.9	4 40 47.7	12.0	294 39 58.3	2 26 24.5	12.0	339 29 36.5	1 38 30.8
12.5	266 53 28.0	4 24 21.7	12.5	301 0 6.7	1 56 14.7	12.5	345 27 14.1	2 8 11.3
13.0	273 31 16.0	4 4 37.5	13.0	307 14 44.8	1 25 5.2	13.0	351 23 19.5	2 36 21.0
13.5	280 2 9.2	+3 42 1.1	13.5	313 24 27.8	+0 53 18.9	13.5	357 18 32.4	−3 2 45.4
14.0	286 26 34.0	3 16 57.7	14.0	319 29 54.0	+0 21 17.0	14.0	3 13 31.8	3 27 10.7
14.5	292 45 2.5	2 49 51.6	14.5	325 31 43.5	−0 10 40.7	14.5	9 8 56.3	3 49 23.6
15.0	298 58 10.1	2 21 6.3	15.0	331 30 37.6	0 42 15.7	15.0	15 5 22.8	4 9 11.3
15.5	305 6 34.6	1 51 4.1	15.5	337 27 17.5	1 13 10.8	15.5	21 3 26.2	4 26 21.3
16.0	311 10 55.5	+1 20 6.0	16.0	343 22 23.9	−1 43 9.4	16.0	27 3 38.9	−4 40 41.2
16.5	317 11 52.5	0 48 32.1	16.5	349 16 36.3	2 11 55.6	16.5	33 6 30.3	4 51 59.2
17.0	323 10 4.7	+0 16 41.6	17.0	355 10 32.4	2 39 14.2	17.0	39 12 26.2	5 0 4.3
17.5	329 6 10.1	−0 15 7.2	17.5	1 4 47.7	3 4 50.1	17.5	45 21 48.7	5 4 46.0
18.0	335 0 45.1	0 46 36.2	18.0	6 59 55.2	3 28 28.4	18.0	51 34 55.8	5 5 55.0
18.5	340 54 24.0	−1 17 28.0	18.5	12 56 24.4	−3 49 55.0	18.5	57 52 0.6	−5 3 24.0
19.0	346 47 38.4	1 47 25.7	19.0	18 54 42.2	4 8 55.3	19.0	64 13 11.8	4 57 7.4
19.5	352 40 57.5	2 16 12.1	19.5	24 55 11.4	4 25 15.9	19.5	70 38 33.2	4 47 2.2
20.0	358 34 47.2	2 43 30.7	20.0	30 58 11.2	4 38 43.5	20.0	77 8 4.0	4 33 8.4
20.5	4 29 30.9	3 9 5.2	20.5	37 3 57.2	4 49 5.7	20.5	83 41 39.1	4 15 29.8
21.0	10 25 28.6	−3 32 39.5	21.0	43 12 41.2	−4 56 11.7	21.0	90 19 9.6	−3 54 13.7
21.5	16 22 57.6	3 53 58.1	21.5	49 24 30.9	4 59 51.7	21.5	97 0 23.0	3 29 31.7
22.0	22 22 12.4	4 12 46.3	22.0	55 39 31.0	4 59 57.8	22.0	103 45 4.4	3 1 39.8
22.5	28 23 25.0	4 28 50.1	22.5	61 57 43.3	4 56 24.6	22.5	110 32 56.9	2 30 57.9
23.0	34 26 45.0	4 41 56.5	23.0	68 19 6.5	4 49 9.0	23.0	117 23 42.7	1 57 50.2
23.5	40 32 20.2	−4 51 54.0	23.5	74 43 37.7	−4 38 11.0	23.5	124 17 3.6	−1 22 44.3
24.0	46 40 17.0	4 58 32.7	24.0	81 11 12.4	4 23 33.3	24.0	131 12 42.0	0 46 11.0
24.5	52 50 41.0	5 1 44.4	24.5	87 41 45.6	4 5 22.3	24.5	138 10 20.7	−0 8 43.5
25.0	59 3 37.0	5 1 22.8	25.0	94 15 12.2	3 43 47.7	25.0	145 9 44.4	+0 29 3.2
25.5	65 19 9.9	4 57 24.0	25.5	100 51 27.4	3 19 2.2	25.5	152 10 38.9	1 6 33.2
26.0	71 37 25.5	−4 49 46.1	26.0	107 30 27.9	−2 51 22.2	26.0	159 12 51.2	+1 43 10.7
26.5	77 58 30.1	4 38 30.0	26.5	114 12 11.4	2 21 7.3	26.5	166 16 9.5	2 18 20.2
27.0	84 22 31.7	4 23 38.7	27.0	120 56 37.3	1 48 39.7	27.0	173 20 22.7	2 51 27.5
27.5	90 49 39.6	4 5 18.2	27.5	127 43 46.3	1 14 24.8	27.5	180 25 19.4	3 22 0.3
28.0	97 20 4.7	3 43 37.0	28.0	134 33 40.7	0 38 50.2	28.0	187 30 48.2	3 49 29.1
28.5	103 53 59.1	3 18 46.3	28.5	141 26 23.3	−0 2 25.8	28.5	194 36 36.5	4 13 27.3
29.0	110 31 36.2	−2 51 0.4	29.0	148 21 56.8	+0 34 16.9	29.0	201 42 29.8	+4 33 31.9
29.5	117 13 10.3	2 20 36.5	29.5	155 20 23.1	1 10 44.5	29.5	208 48 11.8	4 49 24.1
30.0	123 58 55.1	1 47 54.9	30.0	162 21 42.2	1 46 22.9	30.0	215 53 23.9	5 0 49.5
30.5	130 49 3.6	1 13 19.1	30.5	169 25 51.1	2 20 37.4	30.5	222 57 44.8	5 7 38.5
31.0	137 43 46.4	−0 37 15.8	31.0	176 32 42.9	2 52 53.3	31.0	230 0 51.4	5 9 46.6
31.5	144 43 10.8	−0 0 15.1	31.5	183 42 5.5	+3 22 36.9	31.5	237 2 18.7	+5 7 14.6

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JULY.		Day of Month.	AUGUST.		Day of Month.	SEPTEMBER.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	230° 0′ 51″.4	+5° 9′ 46″.6	1.0	280° 53′ 58″.2	+3° 15′ 30″.5	1.0	327° 55′ 36″.9	−0° 49′ 4″.7
1.5	237 2 18.7	5 7 14.6	1.5	287 24 34.0	2 45 59.8	1.5	333 59 39.9	1 21 47.6
2.0	244 1 40.7	5 0 8.1	2.0	293 51 37.8	2 14 36.4	2.0	340 1 47.5	1 53 23.6
2.5	250 58 30.9	4 48 38.0	2.5	300 15 11.1	1 41 47.2	2.5	346 2 12.4	2 23 33.2
3.0	257 52 23.4	4 32 59.8	3.0	306 35 16.8	1 7 59.0	3.0	352 1 7.8	2 51 58.9
3.5	264 42 53.9	+4 13 32.9	3.5	312 51 59.9	+0 33 38.2	3.5	357 58 47.6	−3 18 24.0
4.0	271 29 40.6	3 50 40.1	4.0	319 5 27.1	−0 0 49.6	4.0	3 55 26.3	3 42 34.0
4.5	278 12 24.8	3 24 47.0	4.5	325 15 47.3	0 35 0.2	4.5	9 51 19.6	4 4 15.6
5.0	284 50 52.0	2 56 21.2	5.0	331 23 11.9	1 8 30.6	5.0	15 46 44.5	4 23 17.0
5.5	291 24 52.0	2 25 51.1	5.5	337 27 54.2	1 40 59.5	5.5	21 41 59.5	4 39 27.8
6.0	297 54 19.7	+1 53 45.5	6.0	343 30 10.2	−2 12 7.4	6.0	27 37 25.1	−4 52 38.7
6.5	304 19 15.2	1 20 33.0	6.5	349 30 18.1	2 41 36.4	6.5	33 33 23.2	5 2 42.2
7.0	310 39 43.4	0 46 40.9	7.0	355 28 38.6	3 9 10.2	7.0	39 30 18.0	5 9 31.7
7.5	316 55 54.0	+0 12 35.4	7.5	1 25 34.6	3 34 34.2	7.5	45 28 35.5	5 13 1.5
8.0	323 8 1.6	−0 21 19.0	8.0	7 21 31.2	3 57 35.2	8.0	51 28 43.5	5 13 7.2
8.5	329 16 25.2	−0 54 39.8	8.5	13 16 55.6	−4 18 1.3	8.5	57 31 11.5	−5 9 45.4
9.0	335 21 27.3	1 27 6.4	9.0	19 12 17.0	4 35 41.7	9.0	63 36 30.1	5 2 53.5
9.5	341 23 34.2	1 58 19.9	9.5	25 8 5.9	4 50 26.6	9.5	69 45 11.3	4 52 30.5
10.0	347 23 14.9	2 28 3.0	10.0	31 4 54.3	5 2 7.0	10.0	75 57 47.6	4 38 36.4
10.5	353 21 0.8	2 56 0.3	10.5	37 3 15.5	5 10 35.0	10.5	82 14 51.3	4 21 12.6
11.0	359 17 25.7	−3 21 57.4	11.0	43 3 43.3	−5 15 42.8	11.0	88 36 53.9	−4 0 22.9
11.5	5 13 4.6	3 45 41.2	11.5	49 6 51.7	5 17 23.4	11.5	95 4 25.4	3 36 13.4
12.0	11 8 33.4	4 6 59.4	12.0	55 13 14.4	5 15 31.1	12.0	101 37 53.2	3 8 52.9
12.5	17 4 28.9	4 25 40.3	12.5	61 23 24.5	5 10 0.7	12.5	108 17 40.8	2 38 33.6
13.0	23 1 27.8	4 41 33.1	13.0	67 37 53.5	5 0 48.3	13.0	115 4 6.3	2 5 32.2
13.5	29 0 6.2	−4 54 27.2	13.5	73 57 10.8	−4 47 51.5	13.5	121 57 21.5	−1 30 9.8
14.0	35 0 59.5	5 4 12.5	14.0	80 21 42.7	4 31 9.9	14.0	128 57 29.9	0 52 52.4
14.5	41 4 41.4	5 10 39.4	14.5	86 51 51.8	4 10 46.0	14.5	136 4 25.6	−0 14 11.5
15.0	47 11 43.8	5 13 39.1	15.0	93 27 55.6	3 46 45.3	15.0	143 17 52.2	+0 25 16.5
15.5	53 22 35.8	5 13 3.4	15.5	100 10 5.8	3 19 16.9	15.5	150 37 21.7	1 4 50.3
16.0	59 37 42.7	−5 8 45.5	16.0	106 58 27.5	−2 48 35.0	16.0	158 2 14.6	+1 43 45.2
16.5	65 57 26.3	5 0 40.1	16.5	113 52 58.5	2 14 58.3	16.5	165 31 39.8	2 21 14.3
17.0	72 22 3.6	4 48 43.9	17.0	120 53 28.0	1 38 51.4	17.0	173 4 36.0	2 56 30.6
17.5	78 51 46.8	4 32 56.7	17.5	127 59 37.0	1 0 44.0	17.5	180 39 53.4	3 28 48.6
18.0	85 26 42.0	4 13 21.2	18.0	135 10 57.9	−0 21 11.6	18.0	188 16 16.6	3 57 27.2
18.5	92 6 49.6	−3 50 4.0	18.5	142 26 54.8	+0 19 6.4	18.5	195 52 27.1	+4 21 51.1
19.0	98 52 3.9	3 23 16.4	19.0	149 46 44.2	0 59 26.2	19.0	203 27 7.2	4 41 32.9
19.5	105 42 13.1	2 53 14.3	19.5	157 9 36.1	1 39 2.3	19.5	210 59 3.3	4 56 13.4
20.0	112 36 59.4	2 20 18.7	20.0	164 34 35.7	2 17 8.5	20.0	218 27 8.7	5 5 42.7
20.5	119 35 59.9	1 44 55.8	20.5	172 0 45.3	2 53 0.2	20.5	225 50 26.2	5 9 59.2
21.0	126 38 46.9	−1 7 36.5	21.0	179 27 6.2	+3 25 55.7	21.0	233 8 10.0	+5 9 9.4
21.5	133 44 49.0	−0 28 55.6	21.5	186 52 40.7	3 55 18.2	21.5	240 19 46.2	5 3 26.3
22.0	140 53 31.9	+0 10 28.5	22.0	194 16 34.3	4 20 36.9	22.0	247 24 52.7	4 53 8.1
22.5	148 4 19.8	0 49 55.1	22.5	201 37 57.5	4 41 28.1	22.5	254 23 18.8	4 38 37.0
23.0	155 16 36.0	1 28 43.0	23.0	208 56 6.7	4 57 34.8	23.0	261 15 4.5	4 20 17.8
23.5	162 29 44.5	+2 6 11.0	23.5	216 10 26.0	+5 8 47.8	23.5	268 0 18.1	+3 58 36.8
24.0	169 43 10.5	2 41 39.7	24.0	223 20 26.9	5 15 4.1	24.0	274 39 15.2	3 34 0.9
24.5	176 56 21.4	3 14 32.5	24.5	230 25 48.7	5 16 27.2	24.5	281 12 17.1	3 6 57.0
25.0	184 8 47.1	3 44 16.4	25.0	237 26 18.1	5 13 5.4	25.0	287 39 49.0	2 37 51.6
25.5	191 20 0.6	4 10 23.0	25.5	244 21 48.4	5 5 11.5	25.5	294 2 19.0	2 7 10.4
26.0	198 29 37.9	+4 32 28.7	26.0	251 12 19.2	+4 53 2.2	26.0	300 20 16.2	+1 35 18.2
26.5	205 37 18.3	4 50 15.5	26.5	257 57 54.9	4 36 56.2	26.5	306 34 10.4	1 2 38.8
27.0	212 42 43.9	5 3 30.3	27.0	264 38 43.8	4 17 15.0	27.0	312 44 31.2	+0 29 35.0
27.5	219 45 39.8	5 12 5.4	27.5	271 14 57.3	3 54 21.2	27.5	318 51 46.8	−0 3 31.2
28.0	226 45 53.1	5 15 58.2	28.0	277 46 49.1	3 28 38.5	28.0	324 56 24.1	0 36 18.6
28.5	233 43 13.3	5 15 10.8	28.5	284 14 34.4	3 0 31.3	28.5	330 58 48.0	1 8 27.1
29.0	240 37 31.4	+5 9 49.5	29.0	290 38 28.9	+2 30 24.8	29.0	336 59 21.4	−1 39 37.5
29.5	247 28 40.1	5 0 4.9	29.5	296 58 48.4	1 58 43.7	29.5	342 58 24.9	2 9 31.3
30.0	254 16 33.1	4 46 11.2	30.0	303 15 48.7	1 25 52.7	30.0	348 56 17.2	2 37 51.2
30.5	261 1 5.1	4 28 25.7	30.5	309 29 45.4	0 52 16.7	30.5	354 53 15.1	3 4 20.6
31.0	267 42 12.0	4 7 8.4	31.0	315 40 53.2	+0 18 19.5	31.0	0 49 33.5	3 28 44.3
31.5	274 19 50.5	+3 42 41.9	31.5	321 49 25.8	−0 15 35.1	31.5	6 45 25.9	−3 50 48.3

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	OCTOBER.		Day of Month.	NOVEMBER.		Day of Month.	DECEMBER.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
	° ′ ″	° ′ ″		° ′ ″	° ′ ″		° ′ ″	° ′ ″
1.0	0 49 33.5	—3 28 44.3	1.0	45 23 58.9	—4 59 28.0	1.0	78 49 50.4	—4 1 28.2
1.5	6 45 25.9	3 50 48.3	1.5	51 25 9.5	4 57 31.4	1.5	85 5 20.7	3 40 2.1
2.0	12 41 5.1	4 10 19.6	2.0	57 27 48.4	4 52 13.3	2.0	91 23 18.8	3 15 44.4
2.5	18 36 42.9	4 27 6.8	2.5	63 32 3.9	4 43 34.5	2.5	97 43 47.9	2 48 49.4
3.0	24 32 31.2	4 41 0.1	3.0	69 38 5.2	4 31 37.8	3.0	104 6 52.2	2 19 33.8
3.5	30 28 41.6	—4 51 50.7	3.5	75 46 3.0	—4 16 28.0	3.5	110 32 37.6	—1 48 16.8
4.0	36 25 26.9	4 59 31.8	4.0	81 56 9.6	3 58 11.8	4.0	117 1 11.5	1 15 19.7
4.5	42 23 0.6	5 3 57.7	4.5	88 8 39.9	3 36 57.9	4.5	123 32 43.1	0 41 5.8
5.0	48 21 37.6	5 5 4.6	5.0	94 23 50.6	3 12 57.0	5.0	130 7 23.0	—0 6 0.4
5.5	54 21 34.6	5 2 50.0	5.5	100 42 0.9	2 46 21.7	5.5	136 45 23.3	+0 29 29.6
6.0	60 23 10.3	—4 57 13.1	6.0	107 3 32.3	—2 17 26.8	6.0	143 26 56.7	+1 4 55.7
6.5	66 26 45.6	4 48 14.0	6.5	113 28 47.8	1 46 29.0	6.5	150 12 15.9	1 39 48.2
7.0	72 32 43.5	4 35 54.8	7.0	119 58 11.9	1 13 47.4	7.0	157 1 32.7	2 13 36.5
7.5	78 41 29.2	4 20 18.9	7.5	126 32 9.3	0 39 43.3	7.5	163 54 56.8	2 45 49.0
8.0	84 53 30.0	4 1 31.3	8.0	133 11 4.6	—0 4 40.6	8.0	170 52 34.6	3 15 54.0
8.5	91 9 14.7	—3 39 38.7	8.5	139 55 20.5	+0 30 54.2	8.5	177 54 28.2	+3 43 19.9
9.0	97 29 13.3	3 14 49.9	9.0	146 45 16.8	1 6 32.0	9.0	185 0 33.5	4 7 35.8
9.5	103 53 56.3	2 47 15.6	9.5	153 41 8.3	1 41 41.1	9.5	192 10 39.5	4 28 12.7
10.0	110 23 54.0	2 17 9.4	10.0	160 43 3.7	2 15 47.2	10.0	199 24 27.3	4 44 44.0
10.5	116 59 34.9	1 44 47.7	10.5	167 51 3.3	2 48 14.3	10.5	206 41 29.5	4 56 46.9
11.0	123 41 25.4	—1 10 30.2	11.0	175 4 57.5	+3 18 25.3	11.0	214 1 9.9	+5 4 3.1
11.5	130 29 47.6	—0 34 40.7	11.5	182 24 25.4	3 45 42.6	11.5	221 22 44.0	5 6 20.4
12.0	137 24 57.6	+0 2 13.9	12.0	189 48 53.6	4 9 30.0	12.0	228 45 20.2	5 3 33.1
12.5	144 27 4.0	0 39 41.3	12.5	197 17 36.0	4 29 13.9	12.5	236 8 1.6	4 55 42.8
13.0	151 36 5.8	1 17 6.1	13.0	204 49 34.9	4 44 25.4	13.0	243 29 48.0	4 42 58.7
13.5	158 51 51.2	+1 53 48.6	13.5	212 23 41.9	+4 54 41.7	13.5	250 49 38.5	+4 25 37.3
14.0	166 13 55.2	2 29 6.8	14.0	219 58 40.8	4 59 47.6	14.0	258 6 34.0	4 4 1.6
14.5	173 41 39.8	3 2 16.8	14.5	227 33 10.9	4 59 36.7	14.5	265 19 39.9	3 38 40.3
15.0	181 14 13.3	3 32 35.0	15.0	235 5 50.6	4 54 11.4	15.0	272 28 8.3	3 10 6.3
15.5	188 50 31.3	3 59 19.9	15.5	242 35 21.3	4 43 43.1	15.5	279 31 19.3	2 38 55.1
16.0	196 29 18.7	+4 21 54.5	16.0	250 0 31.2	+4 28 31.3	16.0	286 28 42.3	+2 5 43.6
16.5	204 9 12.3	4 39 48.2	16.5	257 20 18.3	4 9 1.9	16.5	293 19 56.7	1 31 8.5
17.0	211 48 44.9	4 52 38.3	17.0	264 33 52.6	3 45 45.7	17.0	300 4 51.7	0 55 45.1
17.5	219 26 28.8	5 0 11.5	17.5	271 40 37.2	3 19 17.0	17.5	306 43 26.0	+0 20 6.2
18.0	227 1 0.4	5 2 23.9	18.0	278 40 8.5	2 50 11.3	18.0	313 15 46.8	—0 15 17.9
18.5	234 31 4.0	+4 59 20.9	18.5	285 32 16.0	+2 19 4.1	18.5	319 42 9.1	—0 49 59.9
19.0	241 55 35.0	4 51 16.7	19.0	292 17 1.2	1 46 29.6	19.0	326 2 54.3	1 23 36.1
19.5	249 13 41.9	4 38 31.8	19.5	298 54 36.0	1 13 0.0	19.5	332 18 29.3	1 55 45.4
20.0	256 24 47.5	4 21 32.4	20.0	305 25 20.9	0 39 5.0	20.0	338 29 25.1	2 26 9.7
20.5	263 28 28.7	4 0 47.7	20.5	311 49 43.6	+0 5 11.5	20.5	344 36 16.0	2 54 33.6
21.0	270 24 35.9	+3 36 49.1	21.0	318 8 16.8	—0 28 16.4	21.0	350 39 38.5	—3 20 43.5
21.5	277 13 12.0	3 10 8.4	21.5	324 21 37.1	1 0 57.1	21.5	356 40 10.6	3 44 27.9
22.0	283 54 30.1	2 41 16.9	22.0	330 30 23.5	1 32 31.2	22.0	2 38 30.5	4 5 36.5
22.5	290 28 51.7	2 10 44.6	22.5	336 35 16.0	2 2 41.7	22.5	8 35 17.1	4 24 0.0
23.0	296 56 44.8	1 38 59.9	23.0	342 36 55.3	2 31 13.1	23.0	14 31 8.1	4 39 30.4
23.5	303 18 42.1	+1 6 29.1	23.5	348 36 1.0	—2 57 51.4	23.5	20 26 40.1	—4 52 0.3
24.0	309 35 19.5	0 33 36.9	24.0	354 33 11.6	3 22 23.6	24.0	26 22 28.2	5 1 23.0
24.5	315 47 14.5	+0 0 45.5	24.5	0 29 3.8	3 44 37.9	24.5	32 19 5.4	5 7 32.5
25.0	321 55 5.2	—0 31 43.8	25.0	6 24 12.0	4 4 23.1	25.0	38 17 2.4	5 10 23.5
25.5	327 59 29.1	1 3 31.8	25.5	12 19 8.0	4 21 29.0	25.5	44 16 46.9	5 9 51.9
26.0	334 1 2.6	—1 34 20.2	26.0	18 14 20.5	—4 35 46.0	26.0	50 18 43.6	—5 5 54.2
26.5	340 0 20.3	2 3 52.3	26.5	24 10 15.2	4 47 5.2	26.5	56 23 13.9	4 58 28.5
27.0	345 57 54.5	2 31 52.0	27.0	30 7 14.6	4 55 18.8	27.0	62 30 35.6	4 47 34.7
27.5	351 54 14.9	2 58 4.4	27.5	36 5 37.5	5 0 19.9	27.5	68 41 3.1	4 33 14.4
28.0	357 49 48.1	3 22 15.1	28.0	42 5 39.9	5 2 3.1	28.0	74 54 47.2	4 15 31.8
28.5	3 44 57.8	3 44 10.6	28.5	48 7 34.8	5 0 24.2	28.5	81 11 55.1	3 54 33.6
29.0	9 40 5.1	—4 3 38.8	29.0	54 11 32.1	—4 55 20.8	29.0	87 32 30.7	—3 30 29.3
29.5	15 35 27.9	4 20 27.9	29.5	60 17 39.5	4 46 52.5	29.5	93 56 34.8	3 3 31.9
30.0	21 31 21.5	4 34 27.4	30.0	66 26 2.6	4 35 1.2	30.0	100 24 5.7	2 33 57.3
30.5	27 27 59.1	4 45 28.3	30.5	72 36 45.2	4 19 50.9	30.5	106 54 59.3	2 2 5.0
31.0	33 25 31.8	4 53 22.6	31.0	78 49 50.4	4 1 28.2	31.0	113 29 9.8	1 28 17.5
31.5	39 24 8.9	—4 58 4.1	31.5	85 5 20.7	—3 40 2.1	31.5	120 6 30.1	—0 53 0.3

MOON'S EQUATOR, 1887.

FOR GREENWICH MEAN NOON.					
	THE MOON'S EQUATOR.				
Date.	i Inclination to Earth's Equator.	Δ Ascend'g Node on Earth's Equator to Ascending Node on Ecliptic.	☊′ Ascend'g Node on Earth's Equator.	☾ Mean Longitude of the Moon.
	° ′	° ′	° ′	° ′
Jan. 0	24 45.1	332 11.4	358 15.9	348 54.6
10	24 44.7	331 41.2	358 14.2	120 40.4
20	24 44.3	331 11.0	358 12.5	252 26.3
30	24 43.9	330 41.8	358 10.8	24 12.1
Feb. 9	24 43.5	330 11.5	358 9.1	155 57.9
19	24 43.1	329 41.3	358 7.4	287 43.8
March 1	24 42.7	329 11.1	358 5.7	59 29.6
11	24 42.3	328 40.9	358 4.0	191 15.4
21	24 41.9	328 10.6	358 2.3	323 1.3
31	24 41.5	327 40.4	358 0.6	94 47.1
April 10	24 41.0	327 9.2	357 59.0	226 32.9
20	24 40.6	326 38.9	357 57.4	358 18.8
30	24 40.1	326 8.6	357 55.8	130 4.6
May 10	24 39.7	325 38.3	357 54.2	261 50.5
20	24 39.2	325 8.0	357 52.6	33 36.3
30	24 38.7	324 37.7	357 51.0	165 22.1
June 9	24 38.2	324 7.4	357 49.4	297 8.0
19	24 37.7	323 37.1	357 47.8	68 53.8
29	24 37.2	323 6.8	357 46.2	200 39.6
July 9	24 36.7	322 36.5	357 44.6	332 25.5
19	24 36.2	322 6.2	357 42.9	104 11.3
29	24 35.7	321 35.8	357 41.4	235 57.2
Aug. 8	24 35.2	321 5.4	357 39.9	7 43.0
18	24 34.7	320 35.0	357 38.4	139 28.8
28	24 34.1	320 4.6	357 36.9	271 14.7
Sept. 7	24 33.6	319 34.2	357 35.4	43 0.5
17	24 33.0	319 3.8	357 33.9	174 46.3
27	24 32.5	318 33.4	357 32.4	306 32.2
Oct. 7	24 31.9	318 3.0	357 30.9	78 18.0
17	24 31.4	317 32.6	357 29.4	210 3.8
27	24 30.8	317 2.2	357 27.9	341 49.7
Nov. 6	24 30.3	316 31.7	357 26.5	113 35.5
16	24 29.7	316 1.2	357 25.1	245 21.4
26	24 29.1	315 30.7	357 23.7	17 7.2
Dec. 6	24 28.5	315 0.2	357 22.3	148 53.0
16	24 27.9	314 29.7	357 20.9	280 38.9
26	24 27.3	314 9.2	357 19.5	52 24.7
36	24 26.7	313 28.7	357 18.0	184 10.6

Mean Solar Days.	Motion of ☾
	° ′
0.1	1 19.06
0.2	2 38.12
0.3	3 57.18
0.4	5 16.23
0.5	6 35.29
0.6	7 54.35
0.7	9 13.41
0.8	10 32.47
0.9	11 51.53
1.0	13 10.58
2.0	26 21.17
3.0	39 31.75
4.0	52 42.33
5.0	65 52.92
6.0	79 3.50
7.0	92 14.09
8.0	105 24.67
9.0	118 35.25
10.0	131 45.84
Hours.	° ′
1	0 32.94
2	1 5.88
3	1 38.82
4	2 11.76
5	2 44.70
6	3 17.65
7	3 50.59
8	4 23.53
9	4 56.47
10	5 29.41
11	6 2.35
12	6 35.29
13	7 8.23
14	7 41.17
15	8 14.11
16	8 47.06
17	9 20.00
18	9 52.94
19	10 25.88
20	10 58.82
21	11 31.76
22	12 4.70
23	12 37.64

TABLE FOR THE LIBRATION OF THE MOON.

Argument, (☊—λ) or (☊—λ — 180°).

☊ − λ	Δλ	$\frac{1}{a}$	B		☊ − λ	Δλ	$\frac{1}{a}$	B	
0°	0′.0	39	0° 0′.0	180°	46°	0′.6	56	1° 3′.9	134°
1	0.0	39	0 1.6	179	47	0.6	57	1 4.9	133
2	0.0	39	0 3.1	178	48	0.6	58	1 6.0	132
3	0.1	39	0 4.7	177	49	0.6	59	1 7.0	131
4	0.1	39	0 6.2	176	50	0.6	60	1 8.0	130
5	0.1	39	0 7.7	175	51	0.6	62	1 9.0	129
6	0.2	39	0 9.3	174	52	0.6	63	1 10.0	128
7	0.2	39	0 10.8	173	53	0.5	64	1 10.9	127
8	0.2	39	0 12.4	172	54	0.5	66	1 11.8	126
9	0.2	39	0 13.9	171	55	0.5	67	1 12.7	125
10	0.2	39	0 15.4	170	56	0.5	69	1 13.6	124
11	0.3	39	0 16.9	169	57	0.5	71	1 14.5	123
12	0.3	40	0 18.5	168	58	0 5	73	1 15.3	122
13	0.3	40	0 20.0	167	59	0.5	75	1 16.1	121
14	0.3	40	0 21.5	166	60	0.5	77	1 16.9	120
15	0.3	40	0 23.0	165	61	0.5	80	1 17.6	119
16	0.3	40	0 24.5	164	62	0.5	83	1 18.4	118
17	0.3	40	0 26.0	163	63	0.5	86	1 19.1	117
18	0.3	41	0 27.4	162	64	0.5	89	1 19.8	116
19	0.4	41	0 28.9	161	65	0.4	92	1 20.4	115
20	0.4	41	0 30.4	160	66	0.4	95	1 21.1	114
21	0.4	41	0 31.8	159	67	0.4	99	1 21.7	113
22	0.4	42	0 33 2	158	68	0.4	103	1 22.3	112
23	0.4	42	0 34.7	157	69	0.4	108	1 22.9	111
24	0.4	42	0 36.1	156	70	0.4	113	1 23.4	110
25	0.4	43	0 37.5	155	71	0.4	119	1 23.9	109
26	0.5	43	0 38.9	154	72	0.4	125	1 24.4	108
27	0.5	43	0 40.3	153	73	0.4	132	1 24.9	107
28	0.5	44	0 41.7	152	74	0.3	141	1 25.3	106
29	0.5	44	0 43.1	151	75	0.3	150	1 25.7	105
30	0.5	45	0 44.4	150	76	0.3	160	1 26.1	104
31	0.5	45	0 45.7	149	77	0.3	172	1 26.5	103
32	0.5	46	0 47.0	148	78	0.2	186	1 26.8	102
33	0.5	46	0 48.4	147	79	0.2	202	1 27.1	101
34	0.5	47	0 49.7	146	80	0.2	222	1 27.4	100
35	0.5	47	0 51.0	145	81	0.2	247	1 27.7	99
36	0.5	48	0 52.2	144	82	0.2	278	1 27.9	98
37	0.5	48	0 53.4	143	83	0.1	318	1 28.1	97
38	0.6	49	0 54.7	142	84	0.1	370	1 28.3	96
39	0.6	50	0 55.9	141	85	0.1	440	1 28.5	95
40	0.6	50	0 57.1	140	86	0.1	555	1 28.6	94
41	0.6	51	0 58.3	139	87	0.1	740	1 28.7	93
42	0.6	52	0 59.4	138	88	0.0	1110	1 28.7	92
43	0.6	53	1 0.6	137	89	0.0	2220	1 28.8	91
44	0.6	54	1 1.7	136	90	0.0	∞	1 28.8	90
45	0.6	55	1 2.8	135					
	Δλ	$\frac{1}{a}$	B	☊ − λ		Δλ	$\frac{1}{a}$	B	☊ − λ

Δλ has the sign of tan (λ — ☊)
a has the sign of cos (☊ — λ)
B has the sign of sin (☊ — λ)

FOR GREENWICH MEAN NOON.

Date.	Apparent Obliquity of the Ecliptic. (Hansen.)	Equation of Equinoxes In Longitude.	Equation of Equinoxes In R. A.	Precession of Equinoxes in Longitude.	The Sun's Aberration.	The Sun's Hor. Par.	Mean Longitude of Moon's Ascending Node.
Jan. 0	23° 27′ 5″.47	− 8″.26	− 0ˢ.505	0″.00	− 20″.80	9″.00	150° 36′.4
10	5.60	8.01	0.490	1.38	20.79	9.00	150 4.6
20	5.77	7.88	0.482	2.75	20.77	8.99	149 32.8
30	5.99	7.88	0.482	4.13	20.74	8.98	149 1.1
Feb. 9	6.22	8.03	0.491	5.50	20.71	8.96	148 29.3
19	23 27 6.43	− 8.32	− 0.509	6.88	− 20.67	8.94	147 57.4
March 1	6.61	8.74	0.535	8.26	20.63	8.92	147 25.8
11	6.74	9.26	0.566	9.63	20.57	8.90	146 54.0
21	6.80	9.81	0.600	11.01	20.51	8.87	146 22.2
31	6.79	10.37	0.634	12.38	20.45	8.85	145 50.4
April 10	23 27 6.73	− 10.86	− 0.664	13.76	− 20.39	8.82	145 18.7
20	6.63	11.25	0.688	15.14	20.34	8.80	144 46.9
30	6.49	11.52	0.705	16.51	20.29	8.78	144 15.1
May 10	6.35	11.66	0.713	17.89	20.24	8.76	143 43.3
20	6 22	11.66	0.713	19.26	20.19	8.74	143 11.6
30	23 27 6.12	− 11.54	− 0.706	20.64	− 20.16	8.72	142 39.8
June 9	6.06	11.32	0.692	22.02	20.13	8.71	142 8.0
19	6.06	11.05	0.676	23.39	20.11	8.71	141 36.3
29	6.12	10.77	0.659	24.77	20.11	8.70	141 4.5
July 9	6.24	10.52	0.643	26.14	20.10	8.70	140 32.7
19	23 27 6.40	− 10.34	− 0.632	27.52	− 20.12	8.71	140 0.9
29	6.60	10.28	0.629	28.90	20.14	8.72	139 29.2
Aug. 8	6.83	10.34	0.632	30.27	20.17	8.73	138 57.4
18	7.06	10.53	0.644	31.65	20.20	8.75	138 25.6
28	7.26	10.86	0.665	33.02	20.24	8.77	137 53.9
Sept. 7	23 27 7.42	− 11.30	− 0.692	34.40	− 20.29	8.79	137 22.1
17	7.52	11.81	0.723	35.78	20.35	8.81	136 50.3
27	7.57	12.35	0.756	37.15	20.41	8.84	136 18.5
Oct. 7	7.56	12.86	0.787	38.53	20.47	8.87	135 46.8
17	7.50	13.32	0.815	39.90	20.53	8.88	135 15.0
27	23 27 7.39	− 13.67	− 0.836	41.28	− 20.59	8.91	134 43.2
Nov. 6	7.25	13.87	0.849	42.66	20.64	8.93	134 11.4
16	7.12	13.91	0.851	44.03	20.69	8.95	133 39.7
26	7.01	13.82	0.846	45.41	20.73	8.97	133 7.9
Dec. 6	6.94	13.62	0.833	46.78	20.76	8.98	132 36.1
16	23 27 6.93	− 13.32	− 0.815	48.16	− 20.78	8.99	132 4.4
26	6.98	12.98	0.795	49.54	20.79	9.00	131 32.6
36	23 27 7.08	− 12.67	− 0.775	50.91	− 20.79	9.00	131 0.8

Mean Obliquity, 1887.0,	23° 27′ 14″.11 (Hansen).		
Mean Obliquity, 1887.0,	23° 27′ 13″.80 (Peters).		
Precession for 1887.5	50″.2609	log 1.70123	
Precession in a Solar Day	0″.1376	log 9.13863	Daily Motion of ☊ −3′.177
Precession in a Sidereal Day	0″.1372	log 9.13744	
Sun's Mean Equatorial Horizontal Parallax .	8″.848	log 0.94685	

PART II

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF WASHINGTON

FORMULÆ FOR THE REDUCTION OF THE POSITIONS OF THE FIXED STARS, USING THE NOTATION OF BESSEL, AND THE CONSTANTS OF PETERS AND STRUVE.

NOTATION.

τ, the time, reckoned in units of one year, from the beginning of the Besselian fictitious year, (1886, December 30^d.953 = 1887, January 0^d.0 — 0^d.047, Washington mean time),
α_0, δ_0, the star's mean right ascension and declination at the beginning of the fictitious year,
α, δ, the star's apparent right ascension and declination at the time τ,
μ, μ', the annual proper motion in right ascension and declination,
$\odot$, the sun's true longitude,
☊, the longitude of the moon's ascending node,
ω, the obliquity of the ecliptic,
Γ, the longitude of the sun's perigee,
Γ', the longitude of the moon's perigee,
☾, the moon's mean longitude.

BESSELIAN STAR-NUMBERS.

$$\begin{aligned}
A = \tau &- 0.34248 \sin \text{☊} && - 0.00011 \sin (3 \odot - \Gamma)\\
&+ 0.00410 \sin 2 \text{☊} && - 0.00005 \sin 2 (\odot - \text{☊})\\
&- 0.02521 \sin 2 \odot && + 0.00010 \sin 2 (\odot - \Gamma')\\
&+ 0.00293 \sin (\odot + 82^\circ\ 8') && + 0.00009 \sin (2 \Gamma' - \text{☊})\\
&+ 0.00025 \sin (2 \odot - \text{☊}) && + 0.00005 \cos \Gamma'\\
&- 0.00405 \sin 2 \text{☾} && + 0.00004 \sin 2 \Gamma'\\
&+ 0.00135 \sin (\text{☾} - \Gamma') &&
\end{aligned}$$

$$\begin{aligned}
B = &- 9''.2239 \cos \text{☊} && - 0''.0027 \cos (3 \odot - \Gamma)\\
&+ 0.0895 \cos 2 \text{☊} && + 0.0067 \cos (2 \odot - \text{☊})\\
&- 0.5506 \cos 2 \odot && + 0.0024 \cos (2 \Gamma' - \text{☊})\\
&- 0.0092 \cos (\odot + 280^\circ\ 57') && - 0.0023 \sin \Gamma'\\
&- 0.0886 \cos 2 \text{☾} && + 0.0008 \cos 2 \Gamma'
\end{aligned}$$

$$\begin{aligned}
C &= - 20''.4451 \cos \omega \cos \odot\\
D &= - 20.4451 \sin \odot\\
E &= - 0.0461 \sin \text{☊} + 0''.0014 \sin 2 \text{☊} - 0''.0033 \sin 2 \odot
\end{aligned}$$

Bessel's *Star-Constants.*

$a = 3^s.07244 + 1^s.33689 \sin \alpha_0 \tan \delta_0$ = precession in right ascension
$b = \frac{1}{15} \cos \alpha_0 \tan \delta_0$
$c = \frac{1}{15} \cos \alpha_0 \sec \delta_0$
$d = \frac{1}{15} \sin \alpha_0 \sec \delta_0$
$a' = 20''.0533 \cos \alpha_0$ = precession in declination
$b' = - \sin \alpha_0$
$c' = \tan \omega \cos \delta_0 - \sin \alpha_0 \sin \delta_0$
$d' = \cos \alpha_0 \sin \delta_0$

Reduction to Apparent Position.

$\alpha = \alpha_0 + \tau\mu + Aa + Bb + Cc + Dd + E$ (in time)
$\delta = \delta_0 + \tau\mu' + Aa + Bb' + Cc' + Dd'$ (in arc)

INDEPENDENT STAR-NUMBERS.

$f = 46''.0866\ A + E$ (in arc) $= 3^s.07244\ A + \frac{1}{15} E$ (in time)
$g \sin G = B$ $h \sin H = C$ $i = C \tan \omega$
$g \cos G = 20''.0533\ A$ $h \cos H = D$

Reduction to Apparent Position.

$\alpha = \alpha_0 + f + \tau\mu + \frac{1}{15} g \sin (G + \alpha_0) \tan \delta + \frac{1}{15} h \sin (H + \alpha_0) \sec \delta$ (in time)
$\delta = \delta_0 + \tau\mu' + g \cos (G + \alpha_0) + h \cos (H + \alpha_0) \sin \delta + i \cos \delta$ (in arc)

Notes.—(1) The independent star-numbers are more convenient, when only one or two apparent positions of a star are required, or when **Bessel's** star-constants are not known with sufficient accuracy. Otherwise, the Besselian star-numbers are more convenient.

(2) In using the star-constants of the *British Association Catalogue*, a, b, c, d, a', b', c', d', must be changed to c, d, a, b, $-c'$, $-d'$, $-a'$, $-b'$, respectively.

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A.*	Log *B.*	Log *C.*	Log *D.*	Solar Day. (Sid. Hour.)	Log *A.*	Log *B.*	Log *C.*	Log *D.*
Jan. 0	−9.2068	+0.9304	−0.5350	+1.3032	Feb. 15	−8.5278	+0.8862	−1.1980	+1.0437
1	9.2034	0.9301	0.5747	1.3017	16	8.4786	0.8863	1.2028	1.0315
2	9.1991	0.9307	0.6109	1.3001	17	8.4186	0.8855	1.2074	1.0189
3	9.1928	0.9318	0.6442	1.2983	18	8.3516	0.8837	1.2119	1.0058
4	9.1840	0.9332	0.6749	1.2963	19	8.2840	0.8810	1.2162	0.9921
h (7.0) 5	−9.1726	+0.9343	−0.7035	+1.2942	h (10.0) 20	−8.2235	+0.8776	−1.2203	+0.9779
6	9.1586	0.9348	0.7302	1.2920	21	8.1798	0.8741	1.2242	0.9631
7	9.1430	0.9344	0.7553	1.2896	22	8.1590	0.8709	1.2279	0.9475
8	9.1267	0.9330	0.7788	1.2871	23	8.1563	0.8684	1.2315	0.9313
9	9.1108	0.9309	0.8010	1.2844	24	8.1635	0.8670	1.2349	0.9144
10	−9.0967	+0.9281	−0.8219	+1.2815	25	−8.1685	+0.8667	−1.2382	+0.8965
11	9.0850	0.9251	0.8418	1.2785	26	8.1584	0.8673	1.2413	0.8778
12	9.0758	0.9223	0.8607	1.2754	27	8.1268	0.8685	1.2443	0.8582
13	9.0689	0.9201	0.8787	1.2721	28	8.0599	0.8698	1.2471	0.8375
14	9.0630	0.9188	0.8958	1.2686	Mar. 1	7.9440	0.8708	1.2497	0.8156
15	−9.0569	+0.9185	−0.9121	+1.2649	2	−7.7336	+0.8710	−1.2522	+0.7924
16	9.0492	0.9189	0.9277	1.2611	3	−7.2601	0.8702	1.2545	0.7678
17	9.0388	0.9198	0.9426	1.2571	4	+7.2381	0.8683	1.2567	0.7416
18	9.0251	0.9208	0.9569	1.2529	5	7.6831	0.8656	1.2588	0.7136
19	9.0081	0.9214	0.9706	1.2486	6	7.8531	0.8625	1.2607	0.6835
h (8.0) 20	−8.9880	+0.9213	−0.9838	+1.2441	h (11.0) 7	+7.9385	+0.8593	−1.2624	+0.6511
21	8.9666	0.9202	0.9964	1.2394	8	7.9773	0.8567	1.2641	0.6159
22	8.9450	0.9182	1.0085	1.2345	9	7.9903	0.8549	1.2656	0.5775
23	8.9256	0.9154	1.0202	1.2294	10	7.9943	0.8543	1.2669	0.5352
24	8.9096	0.9121	1.0314	1.2241	11	8.0082	0.8548	1.2681	0.4883
25	−8.8981	+0.9087	−1.0422	+1.2186	12	+8.0422	+0.8562	−1.2692	+0.4355
26	8.8908	0.9058	1.0526	1.2129	13	8.0990	0.8580	1.2702	0.3754
27	8.8866	0.9036	1.0626	1.2070	14	8.1723	0.8598	1.2710	0.3053
28	8.8833	0.9023	1.0723	1.2008	15	8.2514	0.8611	1.2716	0.2217
29	8.8791	0.9020	1.0817	1.1945	16	8.3270	0.8614	1.2722	0.1180
30	−8.8713	+0.9025	−1.0907	+1.1879	17	+8.3909	+0.8608	−1.2726	+9.9813
31	8.8589	0.9033	1.0993	1.1811	18	8.4414	0.8591	1.2729	9.7807
Feb. 1	8.8407	0.9041	1.1077	1.1741	19	8.4773	0.8566	1.2731	+9.3965
2	8.8166	0.9044	1.1158	1.1668	20	8.4987	0.8539	1.2731	−9.0132
3	8.7876	0.9038	1.1236	1.1591	21	8.5075	0.8514	1.2730	9.6660
h (9.0) 4	−8.7553	+0.9022	−1.1311	+1.1513	h (12.0) 22	+8.5065	+0.8495	−1.2728	−9.9095
5	8.7226	0.8997	1.1383	1.1432	23	8.5001	0.8487	1.2724	0.0663
6	8.6921	0.8965	1.1452	1.1347	24	8.4932	0.8490	1.2719	0.1811
7	8.6670	0.8929	1.1519	1.1260	25	8.4912	0.8504	1.2713	0.2717
8	8.6484	0.8895	1.1585	1.1170	26	8.4986	0.8525	1.2705	0.3465
9	−8.6357	+0.8866	−1.1648	+1.1076	27	+8.5180	+0.8550	−1.2697	−0.4101
10	8.6277	0.8846	1.1709	1.0979	28	8.5473	0.8572	1.2686	0.4654
11	8.6199	0.8837	1.1767	1.0878	29	8.5830	0.8587	1.2675	0.5144
12	8.6093	0.8837	1.1824	1.0774	30	8.6206	0.8593	1.2662	0.5582
13	8.5920	0.8844	1.1878	1.0666	31	8.6556	0.8588	1.2648	0.5979
14	−8.5654	+0.8854	−1.1930	+1.0553	32	+8.6853	+0.8573	−1.2633	−0.6341
15	−8.5278	+0.8862	−1.1980	+1.0437	33	+8.7078	+0.8553	−1.2616	−0.6674

$E = -0''.02$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A.*	Log *B.*	Log *C.*	Log *D.*	Solar Day. (Sid. Hour.)	Log *A.*	Log *B.*	Log *C.*	Log *D.*
Apr. 1	+8.6853	+0.8573	−1.2633	−0.6341	May 17	+9.1654	+0.8782	−1.0101	−1.2338
2	8.7078	0.8553	1.2616	0.6674	18	9.1677	0.8797	0.9987	1.2335
3	8.7227	0.8531	1.2598	0.6981	19	9.1715	0.8820	0.9868	1.2430
4	8.7313	0.8512	1.2579	0.7268	20	9.1775	0.8848	0.9745	1.2473
5	8.7352	0.8502	1.2558	0.7535	21	9.1861	0.8877	0.9618	1.2514
$(13^{\mathrm{h}}.0)$ 6	+8.7369	+0.8502	−1.2535	−0.7785	$(16^{\mathrm{h}}.0)$ 22	+9.1967	+0.8901	−0.9485	−1.2554
7	8.7393	0.8514	1.2512	0.8020	23	9.2089	0.8917	0.9347	1.2593
8	8.7454	0.8536	1.2487	0.8242	24	9.2216	0.8928	0.9203	1.2630
9	8.7569	0.8564	1.2460	0.8451	25	9.2337	0.8919	0.9053	1.2665
10	8.7739	0.8592	1.2433	0.8650	26	9.2444	0.8906	0.8896	1.2699
11	+8.7955	+0.8617	−1.2403	−0.8839	27	+9.2533	+0.8889	−0.8732	−1.2731
12	8.8195	0.8633	1.2373	0.9018	28	9.2601	0.8871	0.8561	1.2762
13	8.8431	0.8640	1.2340	0.9190	29	9.2651	0.8858	0.8382	1.2791
14	8.8645	0.8635	1.2307	0.9353	30	9.2691	0.8852	0.8193	1.2819
15	8.8817	0.8623	1.2271	0.9509	31	9.2727	0.8857	0.7995	1.2846
16	+8.8939	+0.8605	−1.2235	−0.9658	June 1	+9.2769	+0.8871	−0.7786	−1.2871
17	8.9011	0.8588	1.2197	0.9801	2	9.2822	0.8893	0.7565	1.2895
18	8.9039	0.8576	1.2157	0.9938	3	9.2892	0.8918	0.7381	1.2917
19	8.9041	0.8572	1.2115	1.0070	4	9.2978	0.8942	0.7082	1.2938
20	8.9036	0.8580	1.2072	1.0196	5	9.3080	0.8960	0.6818	1.2958
$(14^{\mathrm{h}}.0)$ 21	+8.9047	+0.8599	−1.2027	−1.0318	$(17^{\mathrm{h}}.0)$ 6	+9.3186	+0.8969	−0.6535	−1.2977
22	8.9085	0.8626	1.1980	1.0435	7	9.3287	0.8968	0.6231	1.2994
23	8.9171	0.8657	1.1932	1.0548	8	9.3381	0.8957	0.5903	1.3010
24	8.9302	0.8687	1.1882	1.0657	9	9.3460	0.8938	0.5547	1.3025
25	8.9470	0.8711	1.1830	1.0761	10	9.3522	0.8917	0.5157	1.3088
26	+8.9658	+0.8726	−1.1776	−1.0862	11	+9.3565	+0.8896	−0.4728	−1.3051
27	8.9845	0.8731	1.1721	1.0960	12	9.3595	0.8881	0.4251	1.3062
28	9.0017	0.8726	1.1663	1.1054	13	9.3618	0.8875	0.3713	1.3071
29	9.0165	0.8713	1.1603	1.1144	14	9.3639	0.8879	0.3098	1.3080
30	9.0272	0.8698	1.1541	1.1232	15	9.3668	0.8892	0.2380	1.3087
May 1	+9.0349	+0.8684	−1.1477	−1.1316	16	+9.3708	+0.8911	−0.1518	−1.3093
2	9.0398	0.8676	1.1411	1.1398	17	9.3765	0.8932	0.0441	1.3098
3	9.0434	0.8677	1.1343	1.1477	18	9.3836	0.8949	9.9004	1.3102
4	9.0470	0.8690	1.1273	1.1553	19	9.3918	0.8960	9.6840	1.3105
5	9.0522	0.8712	1.1200	1.1627	20	9.4006	0.8962	−9.2326	1.3106
$(15^{\mathrm{h}}.0)$ 6	+9.0595	+0.8741	−1.1124	−1.1698	$(18^{\mathrm{h}}.0)$ 21	+9.4093	+0.8952	+9.1500	−1.3106
7	9.0700	0.8772	1.1046	1.1767	22	9.4172	0.8934	9.6566	1.3105
8	9.0825	0.8801	1.0965	1.1834	23	9.4240	0.8909	9.8839	1.3102
9	9.0972	0.8822	1.0882	1.1898	24	9.4294	0.8882	0.0323	1.3099
10	9.1124	0.8834	1.0796	1.1960	25	9.4335	0.8858	0.1429	1.3094
11	+9.1267	+0.8835	−1.0706	−1.2020	26	+9.4367	+0.8841	+0.2306	−1.3088
12	9.1392	0.8827	1.0614	1.2078	27	9.4394	0.8834	0.3034	1.3081
13	9.1492	0.8813	1.0518	1.2133	28	9.4422	0.8836	0.3657	1.3072
14	9.1564	0.8797	1.0420	1.2187	29	9.4458	0.8847	0.4200	1.3063
15	9.1608	0.8784	1.0317	1.2239	30	9.4504	0.8863	0.4682	1.3052
16	+9.1635	+0.8778	−1.0211	−1.2290	31	+9.4561	+0.8879	+0.5114	−1.3040
17	+9.1654	+0.8782	−1.0101	−1.2338	32	+9.4629	+0.8890	+0.5507	−1.3026

$E = -0''.02$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A.*	Log *B.*	Log *C.*	Log *D.*	Solar Day. (Sid. Hour.)	Log *A.*	Log *B.*	Log *C.*	Log *D.*
July 1	+9.4561	+0.8879	+0.5114	−1.3040	Aug. 16	+9.6221	+0.8313	+1.1808	−1.0803
2	9.4629	0.8890	0.5507	1.3026	17	9.6249	0.8272	1.1860	1.0701
3	9.4702	0.8894	0.5865	1.3012	18	9.6269	0.8232	1.1911	1.0595
4	9.4776	0.8887	0.6195	1.2996	19	9.6282	0.8197	1.1959	1.0485
5	9.4846	0.8869	0.6501	1.2979	20	9.6289	0.8172	1.2006	1.0371
$(19^{h}.0)$ 6	+9.4905	+0.8843	+0.6786	−1.2961	$(22^{h}.0)$ 21	+9.6293	+0.8159	+1.2051	−1.0253
7	9.4953	0.8812	0.7051	1.2941	22	9.6301	0.8158	1.2094	1.0130
8	9.4987	0.8781	0.7301	1.2920	23	9.6314	0.8166	1.2137	1.0002
9	9.5010	0.8754	0.7535	1.2898	24	9.6335	0.8178	1.2177	0.9869
10	9.5025	0.8736	0.7757	1.2874	25	9.6363	0.8189	1.2216	0.9731
11	+9.5038	+0.8727	+0.7967	−1.2849	26	+9.6398	+0.8194	+1.2253	−0.9587
12	9.5054	0.8728	0.8166	1.2823	27	9.6436	0.8189	1.2288	0.9436
13	9.5078	0.8737	0.8355	1.2795	28	9.6473	0.8172	1.2322	0.9278
14	9.5112	0.8750	0.8535	1.2766	29	9.6506	0.8144	1.2355	0.9113
15	9.5158	0.8761	0.8706	1.2736	30	9.6532	0.8107	1.2386	0.8941
16	+9.5212	+0.8767	+0.8870	−1.2704	31	+9.6549	+0.8068	+1.2416	−0.8760
17	9.5273	0.8763	0.9027	1.2671	Sept. 1	9.6558	0.8030	1.2444	0.8570
18	9.5334	0.8748	0.9178	1.2636	2	9.6559	0.8000	1.2471	0.8369
19	9.5391	0.8724	0.9322	1.2599	3	9.6557	0.7982	1.2497	0.8157
20	9.5441	0.8691	0.9460	1.2561	4	9.6554	0.7976	1.2521	0.7933
$(20^{h}.0)$ 21	+9.5480	+0.8655	+0.9593	−1.2522	$(23^{h}.0)$ 5	+9.6554	+0.7982	+1.2544	−0.7696
22	9.5509	0.8620	0.9721	1.2481	6	9.6561	0.7997	1.2565	0.7443
23	9.5530	0.8591	0.9844	1.2439	7	9.6576	0.8014	1.2585	0.7173
24	9.5546	0.8572	0.9962	1.2394	8	9.6598	0.8028	1.2604	0.6883
25	9.5561	0.8564	1.0077	1.2348	9	9.6627	0.8034	1.2621	0.6572
26	+9.5581	+0.8565	+1.0187	−1.2301	10	+9.6660	+0.8030	+1.2637	−0.6235
27	9.5608	0.8573	1.0293	1.2251	11	9.6692	0.8013	1.2652	0.5868
28	9.5644	0.8584	1.0396	1.2200	12	9.6720	0.7985	1.2666	0.5466
29	9.5688	0.8592	1.0495	1.2147	13	9.6743	0.7951	1.2678	0.5021
30	9.5738	0.8592	1.0590	1.2092	14	9.6758	0.7915	1.2689	0.4522
31	+9.5790	+0.8582	+1.0682	−1.2035	15	+9.6766	+0.7883	+1.2699	−0.3958
Aug. 1	9.5840	0.8561	1.0771	1.1976	16	9.6769	0.7861	1.2707	0.3308
2	9.5884	0.8529	1.0858	1.1915	17	9.6770	0.7852	1.2714	0.2540
3	9.5919	0.8492	1.0942	1.1852	18	9.6772	0.7856	1.2720	0.1605
4	9.5943	0.8452	1.1023	1.1787	19	9.6778	0.7872	1.2725	0.0409
5	+9.5957	+0.8416	+1.1101	−1.1719	$(0^{h}.0)$ 20	+9.6791	+0.7894	+1.2728	−9.8752
$(21^{h}.0)$ 6	9.5964	0.8387	1.1176	1.1649	21	9.6811	0.7917	1.2730	9.6139
7	9.5968	0.8370	1.1249	1.1577	22	9.6838	0.7935	1.2731	−8.7031
8	9.5972	0.8364	1.1320	1.1502	23	9.6869	0.7944	1.2731	+9.4740
9	9.5982	0.8367	1.1388	1.1425	24	9.6900	0.7941	1.2729	9.8115
10	+9.5999	+0.8377	+1.1454	−1.1345	25	+9.6930	+0.7925	+1.2726	+9.9991
11	9.6025	0.8386	1.1518	1.1262	26	9.6954	0.7900	1.2722	0.1294
12	9.6060	0.8392	1.1580	1.1177	27	9.6970	0.7870	1.2716	0.2296
13	9.6101	0.8388	1.1640	1.1088	28	9.6978	0.7841	1.2709	0.3109
14	9.6143	0.8374	1.1698	1.0996	29	9.6980	0.7818	1.2701	0.3792
15	+9.6185	+0.8348	+1.1754	−1.0901	30	+9.6978	+0.7806	+1.2692	+0.4382
16	+9.6221	+0.8313	+1.1808	−1.0803	31	+9.6974	+0.7807	+1.2681	+0.4901

$E = -0''.01$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A.*	Log *B.*	Log *C.*	Log *D.*	Solar Day. (Sid. Hour.)	Log *A.*	Log *B.*	Log *C.*	Log *D.*
Oct. 1	+9.6974	+0.7807	+1.2681	+0.4901	Nov. 16	+9.7772	+0.8217	+1.0363	+1.2217
2	9.6972	0.7823	1.2669	0.5363	17	9.7807	0.8232	1.0253	1.2270
3	9.6975	0.7847	1.2656	0.5780	18	9.7841	0.8236	1.0139	1.2322
4	9.6986	0.7876	1.2641	0.6159	19	9.7873	0.8228	1.0021	1.2371
$(1^{h}.0)$ 5	9.7004	0.7905	1.2625	0.6506	$(4^{h}.0)$ 20	9.7900	0.8212	0.9898	1.2419
6	+9.7029	+0.7926	+1.2607	+0.6827	21	+9.7920	+0.8193	+0.9770	+1.2465
7	9.7058	0.7937	1.2588	0.7125	22	9.7935	0.8176	0.9636	1.2509
8	9.7088	0.7935	1.2568	0.7403	23	9.7945	0.8166	0.9497	1.2551
9	9.7116	0.7922	1.2547	0.7663	24	9.7952	0.8167	0.9352	1.2591
10	9.7139	0.7901	1.2524	0.7907	25	9.7959	0.8179	0.9200	1.2630
11	+9.7156	+0.7876	+1.2499	+0.8137	26	+9.7968	+0.8202	+0.9042	+1.2667
12	9.7167	0.7854	1.2473	0.8354	27	9.7982	0.8232	0.8876	1.2703
13	9.7172	0.7840	1.2446	0.8560	28	9.8003	0.8263	0.8701	1.2737
14	9.7175	0.7839	1.2417	0.8755	29	9.8030	0.8291	0.8518	1.2769
15	9.7179	0.7850	1.2386	0.8941	30	9.8061	0.8311	0.8326	1.2800
16	+9.7186	+0.7874	+1.2354	+0.9118	Dec. 1	+9.8094	+0.8319	+0.8123	+1.2829
17	9.7198	0.7906	1.2321	0.9287	2	9.8127	0.8315	0.7908	1.2856
18	9.7217	0.7940	1.2286	0.9448	3	9.8158	0.8300	0.7681	1.2883
19	9.7242	0.7972	1.2249	0.9603	4	9 8185	0.8279	0.7440	1.2907
20	9.7272	0.7994	1.2210	0.9751	$(5^{h}.0)$ 5	9.8206	0.8256	0.7184	1.2930
$(2^{h}.0)$ 21	+9.7305	+0.8005	+1.2170	+0.9893	6	+9.8222	+0.8236	+0.6910	+1.2952
22	9.7336	0.8004	1.2128	1.0029	7	9.8235	0.8225	0.6615	1.2972
23	9.7363	0.7992	1.2085	1.0160	8	9.8247	0.8225	0.6297	1.2991
24	9.7384	0.7974	1.2039	1.0286	9	9.8260	0.8236	0.5953	1.3008
25	9.7399	0.7954	1.1992	1.0407	10	9.8276	0.8257	0.5578	1.3024
26	+9.7406	+0.7938	+1.1943	+1.0524	11	+9.8297	+0.8282	+0.5166	+1.3038
27	9.7409	0.7932	1.1892	1.0636	12	9.8323	0.8308	0.4708	1.3051
28	9.7410	0.7939	1.1839	1.0744	13	9.8354	0.8328	0.4196	1.3063
29	9.7412	0.7958	1.1784	1.0849	14	9.8387	0.8338	0.3613	1.3073
30	9.7418	0.7988	1.1727	1.0950	15	9.8421	0.8336	0.2937	1.3082
31	+9.7430	+0.8023	+1.1667	+1.1047	16	+9.8454	+0.8323	+0.2135	+1.3089
Nov. 1	9.7449	0.8059	1.1606	1.1140	17	9.8482	0.8300	0.1148	1.3095
2	9.7475	0.8090	1.1542	1.1230	18	9.8505	0.8272	9.9866	1.3100
3	9.7506	0.8110	1.1476	1.1318	19	9.8522	0.8243	9.8037	1.3103
4	9.7538	0.8119	1.1408	1.1403	20	9.8534	0.8220	+9.4812	1.3105
$(3^{h}.0)$ 5	+9.7569	+0.8116	+1.1337	+1.1484	$(6^{h}.0)$ 21	+9.8544	+0.8206	−8.3808	+1.3106
6	9.7597	0.8103	1.1263	1.1563	22	9.8552	0.8204	9.5600	1.3105
7	9.7620	0.8086	1.1187	1.1639	23	9.8562	0.8213	9.8430	1.3103
8	9.7637	0.8068	1.1108	1.1713	24	9.8575	0.8230	0.0128	1.3099
9	9.7649	0.8057	1.1026	1.1784	25	9.8593	0.8250	0.1345	1.3094
10	+9.7658	+0.8056	+1.0942	+1.1852	26	+9.8616	+0.8267	−0.2203	+1.3088
11	9.7666	0.8067	1.0854	1.1918	27	9.8643	0.8279	0.3070	1.3080
12	9.7677	0.8090	1.0763	1.1982	28	9.8673	0.8279	0.3727	1.3071
13	9.7692	0.8121	1.0668	1.2044	29	9.8704	0.8266	0.4297	1.3061
14	9.7713	0.8156	1.0570	1.2104	30	9.8732	0.8243	0.4799	1.3049
15	+9.7740	+0.8190	+1.0468	+1.2161	31	+9.8757	+0.8211	−0.5248	+1.3036
16	+9.7772	+0.8217	+1.0363	+1.2217	32	+9.8778	+0.8175	−0.5654	+1.3021

$E = -0''.01$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f		G		H		Log g.	Log h.	i	Log i.
			In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	″	s	° ′	h m	° ′	h m			″	
Jan.	0	0.0015	−7.44	−0.496	110 45	7 23.0	350 19	23 21.3	+0.9595	+1.3094	−1.49	−0.1726
	1	0.0043	7.38	0.492	110 37	7 22.5	349 23	23 17.5	0.9589	1.3092	1.63	0.2122
	2	0.0070	7.31	0.487	110 25	7 21.6	348 26	23 13.8	0.9589	1.3090	1.77	0.2485
	3	0.0097	7.21	0.481	110 5	7 20.3	347 30	23 10.0	0.9591	1.3087	1.91	0.2817
	4	0.0125	7.06	0.471	109 40	7 18.6	346 33	23 6.2	0.9593	1.3084	2.05	0.3122
($7^{\mathrm{h}}.0$)	5	0.0152	−6.88	−0.459	109 7	7 16.6	345 37	23 2.4	+0.9590	+1.3081	−2.19	−0.3408
	6	0.0179	6.66	0.444	108 34	7 14.2	344 40	22 58.6	0.9580	1.3077	2.33	0.3678
	7	0.0207	6.43	0.428	107 58	7 11.8	343 43	22 54.9	0.9561	1.3074	2.47	0.3927
	8	0.0234	6.19	0.413	107 23	7 9.6	342 46	22 51.1	0.9534	1.3070	2.61	0.4161
	9	0.0261	5.97	0.398	106 53	7 7.5	341 48	22 47.2	0.9500	1.3066	2.74	0.4384
	10	0.0289	−5.78	−0.385	106 28	7 5.9	340 51	22 43.4	+0.9463	+1.3062	−2.88	−0.4594
	11	0.0316	5.63	0.375	106 10	7 4.6	339 54	22 39.6	0.9426	1.3058	3.02	0.4793
	12	0.0344	5.51	0.367	105 56	7 3.8	338 57	22 35.8	0.9393	1.3054	3.15	0.4980
	13	0.0371	5.42	0.361	105 46	7 3.1	337 59	22 32.0	0.9368	1.3049	3.28	0.5161
	14	0.0398	5.35	0.357	105 37	7 2.4	337 2	22 28.1	0.9352	1.3045	3.41	0.5332
	15	0.0426	−5.27	−0.352	105 25	7 1.7	336 4	22 24.3	+0.9344	+1.3040	−3.54	−0.5496
	16	0.0453	5.18	0.345	105 9	7 0.6	335 6	22 20.4	0.9342	1.3035	3.67	0.5652
	17	0.0480	5.06	0.337	104 47	6 59.1	334 8	22 16.6	0.9344	1.3029	3.80	0.5801
	18	0.0508	4.90	0.327	104 18	6 57.2	333 10	22 12.7	0.9345	1.3024	3.93	0.5944
	19	0.0535	4.72	0.314	103 45	6 55.0	332 12	22 8.8	0.9340	1.3019	4.06	0.6081
($8^{\mathrm{h}}.0$)	20	0.0563	−4.50	−0.300	103 10	6 52.6	331 14	22 4.9	+0.9329	+1.3013	−4.18	−0.6212
	21	0.0590	4.29	0.286	102 35	6 50.3	330 15	22 1.0	0.9308	1.3008	4.30	0.6338
	22	0.0617	4.08	0.272	102 2	6 48.2	329 17	21 57.1	0.9279	1.3002	4.42	0.6459
	23	0.0645	3.90	0.260	101 36	6 46.4	328 18	21 53.2	0.9244	1.2996	4.55	0.6577
	24	0.0672	3.76	0.251	101 17	6 45.1	327 19	21 49.3	0.9206	1.2990	4.67	0.6689
	25	0.0700	−3.67	−0.244	101 4	6 44.3	326 20	21 45.3	+0.9169	+1.2984	−4.79	−0.6799
	26	0.0727	3.60	0.240	100 58	6 43.9	325 21	21 41.4	0.9138	1.2978	4.90	0.6901
	27	0.0754	3.57	0.238	100 55	6 43.7	324 21	21 37.4	0.9115	1.2971	5.02	0.7001
	28	0.0782	3.54	0.236	100 52	6 43.5	323 21	21 33.4	0.9102	1.2965	5.13	0.7098
	29	0.0809	3.51	0.234	100 46	6 43.1	322 22	21 29.4	0.9097	1.2959	5.24	0.7191
	30	0.0836	−3.45	−0.229	100 34	6 42.3	321 22	21 25.4	+0.9099	+1.2952	−5.35	−0.7282
	31	0.0864	3.35	0.223	100 16	6 41.0	320 22	21 21.4	0.9103	1.2946	5.46	0.7368
Feb.	1	0.0891	3.21	0.214	99 50	6 39.3	319 22	21 17.4	0.9105	1.2939	5.56	0.7452
	2	0.0919	3.04	0.203	99 18	6 37.2	318 21	21 13.4	0.9101	1.2932	5.66	0.7532
	3	0.0946	2.85	0.190	98 43	6 34.9	317 21	21 9.4	0.9088	1.2926	5.77	0.7610
($9^{\mathrm{h}}.0$)	4	0.0973	−2.64	−0.176	98 8	6 32.5	316 20	21 5.3	+0.9066	+1.2919	−5.87	−0.7685
	5	0.1001	2.45	0.163	97 36	6 30.4	315 19	21 1.3	0.9036	1.2913	5.97	0.7758
	6	0.1028	2.29	0.152	97 8	6 28.6	314 18	20 57.2	0.8999	1.2906	6.06	0.7828
	7	0.1055	2.16	0.144	96 48	6 27.2	313 17	20 53.1	0.8960	1.2899	6.16	0.7896
	8	0.1083	2.07	0.138	96 34	6 26.3	312 16	20 49.0	0.8923	1.2893	6.25	0.7961
	9	0.1110	−2.01	−0.134	96 25	6 25.7	311 14	20 44.9	+0.8893	+1.2886	−6.34	−0.8023
	10	0.1138	1.98	0.132	96 20	6 25.3	310 13	20 40.8	0.8873	1.2880	6.43	0.8084
	11	0.1165	1.94	0.129	96 14	6 24.9	309 11	20 36.7	0.8863	1.2873	6.52	0.8142
	12	0.1192	1.89	0.126	96 5	6 24.3	308 9	20 32.6	0.8862	1.2867	6.61	0.8199
	13	0.1220	1.82	0.121	95 50	6 23.4	307 6	20 28.4	0.8867	1.2860	6.69	0.8253
	14	0.1247	−1.71	−0.114	95 29	6 21.9	306 4	20 24.3	+0.8874	+1.2854	−6.77	−0.8305
	15	0.1274	−1.57	−0.105	95 1	6 20.1	305 2	20 20.1	+0.8878	+1.2848	−6.84	−0.8355

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	*f*		*G*		*H*		Log *g*.	Log *h*.	*i*	Log *i*.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	"	s	° ′	h m	° ′	h m			"	
Feb. 15	0.1274	− 1.57	−0.105	95 1	6 20.1	305 2	20 20.1	+0.8878	+1.2848	−6.84	−0.8355
16	0.1302	1.41	0.094	94 29	6 17.9	303 59	20 15.9	0.8876	1.2841	6.92	0.8404
17	0.1329	1.23	0.082	93 55	6 15.7	302 56	20 11.8	0.8865	1.2835	7.00	0.8450
18	0.1357	1.06	0.070	93 22	6 13.5	301 53	20 7.6	0.8845	1.2829	7.07	0.8494
19	0.1384	0.91	0.060	92 54	6 11.6	300 50	20 3.3	0.8815	1.2824	7.14	0.8536
($10^{h}.0$) 20	0.1411	− 0.79	−0.053	92 33	6 10.2	299 47	19 59.1	+0.8781	+1.2818	−7.21	−0.8577
21	0.1439	0.72	0.048	92 19	6 9.3	298 44	19 54.9	0.8745	1.2812	7.27	0.8616
22	0.1466	0.68	0.046	92 14	6 8.9	297 40	19 50.7	0.8712	1.2807	7.33	0.8654
23	0.1494	0.68	0.045	92 14	6 8.9	296 37	19 46.4	0.8688	1.2802	7.40	0.8690
24	0.1521	0.69	0.046	92 16	6 9.1	295 33	19 42.2	0.8673	1.2796	7.45	0.8724
25	0.1548	− 0.70	−0.046	92 18	6 9.2	294 29	19 37.9	+0.8670	+1.2791	−7.51	−0.8756
26	0.1576	0.68	0.045	92 15	6 9.0	293 25	19 33.7	0.8676	1.2787	7.56	0.8787
27	0.1603	0.64	0.042	92 4	6 8.2	292 21	19 29.4	0.8688	1.2782	7.62	0.8817
28	0.1630	0.55	0.037	91 47	6 7.1	291 17	19 25.1	0.8700	1.2778	7.66	0.8845
Mar. 1	0.1658	0.42	0.028	91 22	6 5.5	290 13	19 20.8	0.8709	1.2773	7.71	0.8872
2	0.1685	− 0.27	−0.018	90 50	6 3.3	289 8	19 16.5	+0.8710	+1.2769	−7.76	−0.8896
3	0.1713	− 0.10	−0.007	90 17	6 1.1	288 4	19 12.2	0.8702	1.2765	7.80	0.8920
4	0.1740	+ 0.06	+0.004	89 44	5 58.9	286 59	19 7.9	0.8683	1.2761	7.84	0.8942
5	0.1767	0.20	0.014	89 15	5 57.0	285 55	19 3.6	0.8657	1.2757	7.87	0.8962
6	0.1795	0.31	0.021	88 53	5 55.5	284 50	18 59.3	0.8626	1.2754	7.91	0.8981
($11^{h}.0$) 7	0.1822	+ 0.38	+0.025	88 37	5 54.5	283 45	18 55.0	+0.8595	+1.2751	−7.94	−0.8999
8	0.1849	0.42	0.028	88 29	5 53.9	282 40	18 50.7	0.8568	1.2748	7.97	0.9016
9	0.1877	0.43	0.029	88 26	5 53.7	281 35	18 46.4	0.8551	1.2745	8.00	0.9030
10	0.1904	0.44	0.029	88 25	5 53.7	280 31	18 42.0	0.8545	1.2743	8.02	0.9043
11	0.1932	0.45	0.030	88 22	5 53.5	279 26	18 37.7	0.8550	1.2741	8.05	0.9056
12	0.1959	+ 0.49	+0.033	88 14	5 53.0	278 21	18 33.4	+0.8564	+1.2739	−8.07	−0.9067
13	0.1986	0.56	0.037	88 0	5 52.0	277 16	18 29.0	0.8583	1.2737	8.09	0.9077
14	0.2014	0.67	0.044	87 39	5 50.6	276 11	18 24.7	0.8602	1.2735	8.10	0.9084
15	0.2041	0.80	0.054	87 11	5 48.7	275 6	18 20.4	0.8616	1.2734	8.11	0.9091
16	0.2068	0.96	0.064	86 39	5 46.6	274 1	18 16.0	0.8622	1.2733	8.12	0.9097
17	0.2096	+ 1.11	+0.074	86 7	5 44.4	272 56	18 11.7	+0.8618	+1.2732	−8.13	−0.9100
18	0.2123	1.25	0.083	85 37	5 42.5	271 51	18 7.4	0.8603	1.2732	8.13	0.9103
19	0.2151	1.36	0.091	85 13	5 40.9	270 46	18 3.0	0.8582	1.2731	8.14	0.9105
20	0.2178	1.43	0.096	84 57	5 39.8	269 41	17 58.7	0.8556	1.2731	8.14	0.9106
21	0.2205	1.46	0.098	84 49	5 39.2	268 36	17 54.4	0.8532	1.2731	8.14	0.9105
($12^{h}.0$) 22	0.2233	+ 1.46	+0.097	84 48	5 39.2	267 31	17 50.1	+0.8513	+1.2732	−8.13	−0.9103
23	0.2260	1.44	0.096	84 52	5 39.5	266 26	17 45.7	0.8504	1.2733	8.12	0.9098
24	0.2288	1.41	0.094	84 57	5 39.8	265 22	17 41.4	0.8507	1.2734	8.12	0.9094
25	0.2315	1.41	0.094	84 59	5 40.0	264 17	17 37.1	0.8521	1.2735	8.11	0.9088
26	0.2342	1.43	0.096	84 56	5 39.7	263 12	17 32.8	0.8542	1.2736	8.09	0.9080
27	0.2370	+ 1.50	+0.100	84 44	5 38.9	262 8	17 28.5	+0.8568	+1.2738	−8.07	−0.9071
28	0.2397	1.60	0.107	84 23	5 37.6	261 3	17 24.2	0.8593	1.2740	8.06	0.9061
29	0.2424	1.74	0.116	83 56	5 35.7	259 59	17 19.9	0.8612	1.2742	8.04	0.9050
30	0.2452	1.90	0.127	83 24	5 33.6	258 55	17 15.7	0.8622	1.2744	8.01	0.9037
31	0.2479	2.06	0.138	82 50	5 31.4	257 51	17 11.4	0.8622	1.2747	7.99	0.9023
32	0.2507	+ 2.21	+0.147	82 19	5 29.3	256 47	17 7.1	+0.8612	+1.2749	−7.96	−0.9007
33	0.2534	+ 2.33	+0.155	81 52	5 27.5	255 43	17 2.9	+0.8596	+1.2752	−7.92	−0.8990

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	"	s	° ′	h m	° ′	h m			"	
Apr. 1	0.2507	+2.21	+0.147	82 19	5 29.3	256 47	17 7.1	+0.8612	+1.2749	−7.96	−0.9007
2	0.2534	2.33	0.155	81 52	5 27.5	255 43	17 2.9	0.8596	1.2752	7.92	0.8990
3	0.2561	2.41	0.161	81 33	5 26.2	254 39	16 58.6	0.8578	1.2756	7.89	0.8973
4	0.2589	2.46	0.164	81 21	5 25.4	253 36	16 54.4	0.8562	1.2759	7.86	0.8953
5	0.2616	2.48	0.166	81 15	5 25.0	252 32	16 50.2	0.8552	1.2762	7.82	0.8932
($13^{h}.0$) 6	0.2643	+2.49	+0.166	81 13	5 24.9	251 29	16 45.9	+0.8553	+1.2766	−7.78	−0.8910
7	0.2671	2.51	0.167	81 12	5 24.8	250 26	16 41.7	0.8566	1.2770	7.74	0.8887
8	0.2698	2.54	0.170	81 7	5 24.5	249 23	16 37.5	0.8588	1.2774	7.70	0.8862
9	0.2726	2.61	0.174	80 56	5 23.8	248 20	16 33.3	0.8618	1.2779	7.65	0.8836
10	0.2753	2.72	0.181	80 39	5 22.6	247 17	16 29.2	0.8650	1.2783	7.60	0.8807
11	0.2780	+2.86	+0.190	80 14	5 20.9	246 15	16 25.0	+0.8680	+1.2788	−7.56	−0.8778
12	0.2808	3.02	0.201	79 43	5 18.9	245 12	16 20.8	0.8704	1.2793	7.49	0.8747
13	0.2835	3.19	0.213	79 11	5 16.7	244 10	16 16.7	0.8718	1.2798	7.44	0.8715
14	0.2862	3.35	0.224	78 38	5 14.6	243 8	16 12.5	0.8721	1.2803	7.38	0.8681
15	0.2890	3.49	0.233	78 9	5 12.6	242 7	16 8.4	0.8716	1.2808	7.32	0.8647
16	0.2917	+3.59	+0.239	77 47	5 11.1	241 5	16 4.3	+0.8705	+1.2813	−7.26	−0.8610
17	0.2945	3.65	0.243	77 32	5 10.1	240 4	16 0.2	0.8691	1.2819	7.20	0.8571
18	0.2972	3.67	0.245	77 25	5 9.7	239 2	15 56.1	0.8681	1.2824	7.13	0.8532
19	0.2999	3.67	0.245	77 24	5 9.6	238 1	15 52.1	0.8678	1.2830	7.06	0.8490
20	0.3027	3.67	0.245	77 27	5 9.8	237 0	15 48.0	0.8685	1.2836	6.99	0.8446
($14^{h}.0$) 21	0.3054	+3.68	+0.245	77 28	5 9.9	236 0	15 44.0	+0.8704	+1.2842	−6.92	−0.8402
22	0.3081	3.71	0.247	77 26	5 9.7	234 59	15 39.9	0.8731	1.2848	6.85	0.8356
23	0.3109	3.79	0.252	77 17	5 9.1	233 59	15 35.9	0.8765	1.2854	6.77	0.8308
24	0.3136	3.90	0.260	76 59	5 8.0	232 59	15 31.9	0.8800	1.2860	6.70	0.8258
25	0.3164	4.06	0.270	76 34	5 6.3	231 59	15 27.9	0.8832	1.2866	6.61	0.8205
26	0.3191	+4.24	+0.282	76 3	5 4.2	230 59	15 23.9	+0.8856	+1.2872	−6.53	−0.8151
27	0.3218	4.43	0.295	75 28	5 1.9	230 0	15 20.0	0.8872	1.2878	6.45	0.8096
28	0.3246	4.61	0.307	74 54	4 59.6	229 1	15 16.0	0.8879	1.2885	6.36	0.8038
29	0.3273	4.77	0.318	74 22	4 57.5	228 1	15 12.1	0.8877	1.2891	6.28	0.7979
30	0.3301	4.89	0.326	73 56	4 55.7	227 2	15 8.2	0.8871	1.2897	6.19	0.7917
May 1	0.3328	+4.97	+0.331	73 36	4 54.4	226 4	15 4.3	+0.8864	+1.2904	−6.10	−0.7852
2	0.3355	5.03	0.335	73 24	4 53.6	225 5	15 0.4	0.8861	1.2910	6.01	0.7787
3	0.3383	5.07	0.338	73 16	4 53.1	224 7	14 56.5	0.8865	1.2916	5.91	0.7718
4	0.3410	5.11	0.341	73 11	4 52.8	223 9	14 52.6	0.8880	1.2923	5.82	0.7647
5	0.3437	5.18	0.345	73 5	4 52.3	222 11	14 48.7	0.8904	1.2929	5.72	0.7574
($15^{h}.0$) 6	0.3465	+5.26	+0.351	72 55	4 51.6	221 14	14 44.9	+0.8937	+1.2935	−5.62	−0.7498
7	0.3492	5.39	0.359	72 39	4 50.6	220 16	14 41.1	0.8975	1.2942	5.52	0.7420
8	0.3520	5.55	0.370	72 16	4 49.1	219 19	14 37.2	0.9012	1.2948	5.42	0.7340
9	0.3547	5.74	0.383	71 47	4 47.2	218 22	14 33.4	0.9045	1.2954	5.32	0.7256
10	0.3574	5.95	0.397	71 14	4 44.9	217 25	14 29.6	0.9071	1.2960	5.21	0.7170
11	0.3602	+6.15	+0.410	70 39	4 42.6	216 28	14 25.9	+0.9087	+1.2966	−5.11	−0.7081
12	0.3629	6.33	0.422	70 6	4 40.4	215 31	14 22.1	0.9094	1.2972	5.00	0.6990
13	0.3656	6.48	0.432	69 37	4 38.5	214 35	14 18.3	0.9093	1.2978	4.89	0.6894
14	0.3684	6.59	0.439	69 14	4 36.9	213 39	14 14.6	0.9088	1.2984	4.78	0.6795
15	0.3711	6.65	0.444	68 59	4 35.9	212 43	14 10.9	0.9083	1.2990	4.67	0.6693
16	0.3739	+6.70	+0.446	68 50	4 35.3	211 47	14 7.1	+0.9082	+1.2995	−4.56	−0.6586
17	0.3766	+6.72	+0.448	68 46	4 35.1	210 51	14 3.4	+0.9088	+1.3001	−4.44	−0.6477

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
May 17	0.3766	+ 6.72	+0.448	68 46	4 35.1	210 51	14 3.4	+0.9088	+1.3001	−4.44	−0.6477
18	0.3793	6.76	0.451	68 44	4 34.9	209 56	13 59.7	0.9103	1.3007	4.33	0.6364
19	0.3821	6.82	0.455	68 40	4 34.7	209 1	13 56.0	0.9128	1.3012	4.21	0.6245
20	0.3848	6.92	0.461	68 31	4 34.1	208 5	13 52.4	0.9161	1.3017	4.09	0.6121
21	0.3875	7.05	0.470	68 16	4 33.1	207 10	13 48.7	0.9197	1.3022	3.97	0.5993
(16^{h}.0) 22	0.3903	+ 7.23	+0.482	67 54	4 31.6	206 15	13 45.0	+0.9232	+1.3027	−3.85	−0.5855
23	0.3930	7.44	0.496	67 24	4 29.6	205 21	13 41.4	0.9264	1.3032	3.73	0.5722
24	0.3958	7.66	0.510	66 50	4 27.3	204 26	13 37.7	0.9288	1.3037	3.61	0.5577
25	0.3985	7.87	0.525	66 13	4 24.9	203 31	13 34.1	0.9304	1.3042	3.49	0.5427
26	0.4012	8.07	0.538	65 38	4 22.5	202 37	13 30.5	0.9311	1.3046	3.37	0.5271
27	0.4040	+ 8.24	+0.549	65 6	4 20.4	201 43	13 26.9	+0.9312	+1.3051	−3.24	−0.5107
28	0.4067	8.37	0.558	64 40	4 18.7	200 49	13 23.3	0.9310	1.3055	3.12	0.4935
29	0.4095	8.47	0.565	64 21	4 17.4	199 55	13 19.7	0.9308	1.3059	2.99	0.4756
30	0.4122	8.55	0.570	64 7	4 16.4	199 1	13 16.1	0.9312	1.3063	2.86	0.4566
31	0.4149	8.62	0.574	63 57	4 15.8	198 7	13 12.5	0.9322	1.3067	2.73	0.4369
June 1	0.4177	+ 8.70	+0.580	63 48	4 15.2	197 14	13 8.9	+0.9342	+1.3070	−2.61	−0.4160
2	0.4204	8.81	0.587	63 38	4 14.6	196 20	13 5.3	0.9370	1.3074	2.48	0.3945
3	0.4231	8.95	0.597	63 24	4 13.6	195 27	13 1.8	0.9404	1.3077	2.35	0.3706
4	0.4259	9.13	0.609	63 4	4 12.3	194 33	12 58.2	0.9440	1.3080	2.22	0.3458
5	0.4286	9.35	0.623	62 37	4 10.5	193 40	12 54.7	0.9476	1.3083	2.08	0.3192
(17^{h}.0) 6	0.4314	+ 9.57	+0.638	62 6	4 8.4	192 47	12 51.1	+0.9506	+1.3086	−1.95	−0.2910
7	0.4341	9.81	0.654	61 32	4 6.1	191 54	12 47.6	0.9528	1.3089	1.82	0.2608
8	0.4368	10.02	0.668	60 57	4 3.8	191 1	12 44.1	0.9541	1.3091	1.69	0.2279
9	0.4396	10.21	0.680	60 24	4 1.6	190 8	12 40.5	0.9546	1.3093	1.55	0.1921
10	0.4423	10.35	0.690	59 56	3 59.7	189 15	12 37.0	0.9545	1.3095	1.42	0.1529
11	0.4450	+10.46	+0.697	59 34	3 58.2	188 22	12 33.5	+0.9540	+1.3097	−1.29	−0.1103
12	0.4478	10.53	0.702	59 18	3 57.2	187 29	12 30.0	0.9537	1.3099	1.16	0.0626
13	0.4505	10.58	0.706	59 8	3 56.5	186 37	12 26.4	0.9538	1.3101	1.02	0.0086
14	0.4533	10.64	0.709	59 2	3 56.1	185 44	12 22.9	0.9547	1.3102	0.89	9.9473
15	0.4560	10.71	0.714	58 57	3 55.8	184 51	12 19.4	0.9564	1.3103	0.75	9.8754
16	0.4587	+10.81	+0.721	58 49	3 55.3	183 59	12 15.9	+0.9588	+1.3104	−0.62	−9.7894
17	0.4615	10.95	0.730	58 36	3 54.4	183 6	12 12.4	0.9619	1.3105	0.48	9.6816
18	0.4642	11.13	0.742	58 18	3 53.2	182 14	12 8.9	0.9651	1.3105	0.35	9.5378
19	0.4669	11.34	0.756	57 52	3 51.5	181 21	12 5.4	0.9682	1.3106	0.21	9.3212
20	0.4697	11.58	0.772	57 21	3 49.4	180 29	12 1.9	0.9708	1.3106	−0.07	−8.8690
(18^{h}.0) 21	0.4724	+11.81	+0.788	56 46	3 47.1	179 36	11 58.4	+0.9728	+1.3106	+0.06	+8.7890
22	0.4752	12.03	0.802	56 11	3 44.7	178 44	11 54.9	0.9739	1.3106	0.20	9.2945
23	0.4779	12.22	0.815	55 37	3 42.5	177 51	11 51.4	0.9743	1.3106	0.33	9.5216
24	0.4806	12.37	0.825	55 7	3 40.5	176 59	11 47.9	0.9742	1.3105	0.47	9.6699
25	0.4834	12.49	0.833	54 43	3 38.9	176 6	11 44.4	0.9740	1.3104	0.60	9.7802
26	0.4861	+12.58	+0.839	54 25	3 37.6	175 14	11 40.9	+0.9739	+1.3103	+0.74	+9.8680
27	0.4889	12.66	0.844	54 12	3 36.8	174 21	11 37.4	0.9744	1.3102	0.87	9.9398
28	0.4916	12.74	0.849	54 2	3 36.1	173 28	11 33.9	0.9755	1.3101	1.01	0.0031
29	0.4943	12.85	0.857	53 53	3 35.5	172 36	11 30.4	0.9775	1.3099	1.14	0.0574
30	0.4971	12.99	0.866	53 41	3 34.7	171 43	11 26.9	0.9801	1.3097	1.28	0.1057
31	0.4998	+13.16	+0.877	53 25	3 33.7	170 50	11 23.4	+0.9831	+1.3096	+1.41	+0.1489
32	0.5025	+13.37	+0.891	53 4	3 32.3	169 58	11 19.8	+0.9863	+1.3094	+1.54	+0.1881

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f		G		H		Log g.	Log h.	i	Log i.
			In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	″	s	° ′	h m	° ′	h m			″	
July	1	0.4998	+13.16	+0.877	53 25	3 33.7	170 50	11 23.4	+0.9831	+1.3096	+1.41	+0.1489
	2	0.5025	13.37	0.891	53 4	3 32.3	169 58	11 19.8	0.9863	1.3094	1.54	0.1881
	3	0.5053	13.59	0.906	52 37	3 30.5	169 5	11 16.3	0.9892	1.3091	1.68	0.2240
	4	0.5080	13.83	0.922	52 6	3 28.4	168 12	11 12.8	0.9915	1.3089	1.81	0.2570
	5	0.5108	14.05	0.937	51 33	3 26.2	167 19	11 9.3	0.9931	1.3086	1.94	0.2876
$(19^{h}.0)$	6	0.5135	+14.25	+0.950	51 0	3 24.0	166 26	11 5.7	+0.9938	+1.3083	+2.07	+0.3160
	7	0.5162	14.40	0.960	50 30	3 22.0	165 33	11 2.2	0.9939	1.3081	2.20	0.3426
	8	0.5190	14.52	0.968	50 4	3 20.3	164 40	10 58.7	0.9934	1.3078	2.33	0.3674
	9	0.5217	14.59	0.973	49 45	3 19.0	163 47	10 55.1	0.9928	1.3074	2.46	0.3909
	10	0.5244	14.65	0.976	49 31	3 18.1	162 54	10 51.6	0.9924	1.3071	2.59	0.4131
	11	0.5272	+14.69	+0.979	49 23	3 17.5	162 0	10 48.0	+0.9924	+1.3067	+2.72	+0.4343
	12	0.5299	14.74	0.983	49 17	3 17.1	161 7	10 44.4	0.9932	1.3063	2.84	0.4541
	13	0.5327	14.83	0.988	49 11	3 16.8	160 13	10 40.9	0.9947	1.3060	2.97	0.4731
	14	0.5354	14.94	0.996	49 3	3 16.2	159 19	10 37.3	0.9969	1.3056	3.10	0.4909
	15	0.5381	15.10	1.006	48 50	3 15.4	158 25	10 33.7	0.9995	1.3051	3.22	0.5082
	16	0.5409	+15.29	+1.019	48 30	3 14.0	157 32	10 30.1	+1.0022	+1.3047	+3.35	+0.5245
	17	0.5436	15.51	1.034	48 5	3 12.3	156 38	10 26.5	1.0047	1.3043	3.47	0.5402
	18	0.5463	15.73	1.048	47 35	3 10.4	155 43	10 22.9	1.0066	1.3038	3.59	0.5552
	19	0.5491	15.93	1.062	47 3	3 8.2	154 49	10 19.3	1.0079	1.3033	3.71	0.5695
	20	0.5518	16.12	1.075	46 30	3 6.0	153 54	10 15.6	1.0085	1.3028	3.83	0.5834
$(20^{h}.0)$	21	0.5546	+16.26	+1.084	46 1	3 4.0	153 0	10 12.0	+1.0085	+1.3023	+3.95	+0.5967
	22	0.5573	16.37	1.091	45 35	3 2.4	152 6	10 8.4	1.0081	1.3018	4.07	0.6096
	23	0.5600	16.45	1.097	45 16	3 1.0	151 11	10 4.7	1.0077	1.3013	4.19	0.6219
	24	0.5628	16.51	1.101	45 2	3 0.1	150 15	10 1.0	1.0075	1.3008	4.30	0.6337
	25	0.5655	16.57	1.105	44 52	2 59.5	149 20	9 57.3	1.0079	1.3002	4.42	0.6451
	26	0.5683	+16.65	+1.110	44 45	2 59.0	148 25	9 53.7	+1.0089	+1.2997	+4.53	+0.6561
	27	0.5710	16.75	1.117	44 38	2 58.5	147 30	9 50.0	1.0107	1.2991	4.64	0.6667
	28	0.5737	16.89	1.126	44 27	2 57.8	146 35	9 46.3	1.0131	1.2985	4.75	0.6771
	29	0.5765	17.06	1.137	44 13	2 56.9	145 39	9 42.6	1.0156	1.2979	4.86	0.6869
	30	0.5792	17.26	1.151	43 54	2 55.6	144 43	9 38.9	1.0183	1.2974	4.97	0.6965
	31	0.5819	+17.47	+1.165	43 29	2 53.9	143 47	9 35.1	+1.0205	+1.2968	+5.08	+0.7058
Aug.	1	0.5847	17.67	1.178	43 1	2 52.0	142 51	9 31.4	1.0222	1.2962	5.18	0.7147
	2	0.5874	17.85	1.190	42 31	2 50.1	141 54	9 27.6	1.0231	1.2956	5.29	0.7233
	3	0.5902	18.00	1.200	42 3	2 48.2	140 58	9 23.9	1.0233	1.2950	5.39	0.7317
	4	0.5929	18.10	1.206	41 38	2 46.5	140 1	9 20.1	1.0229	1.2943	5.49	0.7397
	5	0.5956	+18.16	+1.210	41 18	2 45.2	139 4	9 16.3	+1.0221	+1.2937	+5.59	+0.7476
$(21^{h}.0)$	6	0.5984	18.19	1.212	41 4	2 44.3	138 7	9 12.5	1.0212	1.2932	5.69	0.7551
	7	0.6011	18.20	1.213	40 56	2 43.7	137 10	9 8.7	1.0207	1.2925	5.79	0.7624
	8	0.6038	18.22	1.214	40 51	2 43.4	136 13	9 4.8	1.0207	1.2918	5.88	0.7695
	9	0.6066	18.26	1.217	40 49	2 43.3	135 15	9 1.0	1.0214	1.2912	5.97	0.7763
	10	0.6093	+18.33	+1.222	40 46	2 43.1	134 17	8 57.1	+1.0227	+1.2906	+6.07	+0.7829
	11	0.6121	18.44	1.229	40 40	2 42.6	133 19	8 53.3	1.0247	1.2899	6.16	0.7894
	12	0.6148	18.59	1.239	40 28	2 41.9	132 21	8 49.4	1.0269	1.2893	6.24	0.7955
	13	0.6175	18.77	1.251	40 11	2 40.7	131 22	8 45.5	1.0292	1.2887	6.33	0.8015
	14	0.6203	18.95	1.264	39 49	2 39.2	130 24	8 41.6	1.0310	1.2881	6.42	0.8073
	15	0.6230	+19.14	+1.276	39 22	2 37.5	129 25	8 37.7	+1.0325	+1.2875	+6.50	+0.8130
	16	0.6257	+19.29	+1.286	38 55	2 35.7	128 26	8 33.7	+1.0332	+1.2868	+6.58	+0.8183

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
Aug. 16	0.6257	+19.29	+1.286	38 55	2 35.7	128 26	8 33.7	+1.0332	+1.2868	+6.58	+0.8183
17	0.6285	19.42	1.295	38 28	2 33.9	127 27	8 29.8	1.0333	1.2862	6.66	0.8235
18	0.6312	19.51	1.301	38 5	2 32.3	126 27	8 25.8	1.0330	1.2856	6.74	0.8285
19	0.6340	19.56	1.304	37 47	2 31.1	125 28	8 21.8	1.0324	1.2850	6.81	0.8334
20	0.6367	19.59	1.306	37 35	2 30.3	124 28	8 17.9	1.0319	1.2844	6.89	0.8381
$(22^{\mathrm{h}}.0)$ 21	0.6394	+19.62	+1.308	37 28	2 29.9	123 28	8 13.9	+1.0318	+1.2839	+6.96	+0.8426
22	0.6422	19.65	1.310	37 24	2 29.6	122 28	8 9.9	1.0322	1.2833	7.03	0.8470
23	0.6449	19.71	1.314	37 22	2 29.5	121 28	8 5.8	1.0334	1.2827	7.10	0.8511
24	0.6477	19.81	1.320	37 19	2 29.3	120 27	8 1.8	1.0351	1.2821	7.16	0.8552
25	0.6504	19.94	1.329	37 13	2 28.8	119 26	7 57.8	1.0373	1.2816	7.23	0.8591
26	0.6531	+20.10	+1.340	37 1	2 28.1	118 26	7 53.7	+1.0397	+1.2811	+7.29	+0.8628
27	0.6559	20.27	1.352	36 45	2 27.0	117 24	7 49.6	1.0419	1.2805	7.35	0.8663
28	0.6586	20.44	1.363	36 25	2 25.6	116 23	7 45.6	1.0438	1.2800	7.41	0.8696
29	0.6613	20.60	1.373	36 1	2 24.1	115 22	7 41.5	1.0449	1.2795	7.46	0.8729
30	0.6641	20.73	1.382	35 38	2 22.5	114 20	7 37.4	1.0454	1.2791	7.52	0.8761
31	0.6668	+20.81	+1.387	35 17	2 21.1	113 19	7 33.3	+1.0452	+1.2786	+7.57	+0.8791
Sept. 1	0.6696	20.85	1.390	34 59	2 20.0	112 17	7 29.1	1.0445	1.2781	7.62	0.8818
2	0.6723	20.86	1.391	34 48	2 19.2	111 15	7 25.0	1.0437	1.2777	7.66	0.8845
3	0.6750	20.84	1.390	34 42	2 18.8	110 13	7 20.9	1.0429	1.2773	7.71	0.8871
4	0.6778	20.83	1.389	34 41	2 18.7	109 11	7 16.7	1.0425	1.2769	7.75	0.8896
$(23^{\mathrm{h}}.0)$ 5	0.6805	+20.83	+1.389	34 43	2 18.9	108 8	7 12.5	+1.0427	+1.2765	+7.79	+0.8918
6	0.6832	20.86	1.391	34 46	2 19.1	107 5	7 8.4	1.0436	1.2761	7.83	0.8939
7	0.6860	20.94	1.396	34 47	2 19.1	106 3	7 4.2	1.0452	1.2758	7.87	0.8959
8	0.6887	21.04	1.402	34 44	2 18.9	105 0	7 0.0	1.0472	1.2754	7.90	0.8979
9	0.6915	21.19	1.412	34 35	2 18.3	103 57	6 55.8	1.0494	1.2751	7.93	0.8996
10	0.6942	+21.35	+1.423	34 22	2 17.4	102 54	6 51.6	+1.0514	+1.2749	+7.96	+0.9012
11	0.6969	21.51	1.434	34 3	2 16.2	101 51	6 47.4	1.0531	1.2746	7.99	0.9026
12	0.6997	21.65	1.443	33 43	2 14.9	100 47	6 43.1	1.0542	1.2743	8.02	0.9040
13	0.7024	21.76	1.451	33 22	2 13.5	99 44	6 39.0	1.0547	1.2741	8.04	0.9052
14	0.7051	21.83	1.455	33 4	2 12.2	98 40	6 34.7	1.0546	1.2739	8.06	0.9064
15	0.7079	+21.87	+1.458	32 49	2 11.3	97 37	6 30.4	+1.0543	+1.2737	+8.08	+0.9074
16	0.7106	21.89	1.459	32 40	2 10.7	96 33	6 26.2	1.0539	1.2736	8.09	0.9081
17	0.7134	21.89	1.460	32 37	2 10.4	95 29	6 22.0	1.0537	1.2734	8.11	0.9089
18	0.7161	21.90	1.460	32 37	2 10.5	94 26	6 17.7	1.0539	1.2733	8.12	0.9095
19	0.7188	21.94	1.462	32 41	2 10.7	93 22	6 13.4	1.0548	1.2733	8.13	0.9099
$(0^{\mathrm{h}}.0)$ 20	0.7216	+22.00	+1.467	32 44	2 10.9	92 18	6 9.2	+1.0564	+1.2732	+8.13	+0.9102
21	0.7243	22.10	1.473	32 45	2 11.0	91 14	6 4.9	1.0585	1.2732	8.14	0.9105
22	0.7270	22.24	1.483	32 42	2 10.8	90 10	6 0.6	1.0609	1.2731	8.14	0.9106
23	0.7298	22.40	1.493	32 34	2 10.3	89 5	5 56.4	1.0634	1.2731	8.14	0.9105
24	0.7325	22.56	1.504	32 22	2 9.4	88 1	5 52.1	1.0655	1.2732	8.13	0.9104
25	0.7353	+22.72	+1.514	32 6	2 8.4	86 57	5 47.8	+1.0672	+1.2732	+8.13	+0.9101
26	0.7380	22.84	1.523	31 48	2 7.2	85 53	5 43.5	1.0682	1.2733	8.12	0.9096
27	0.7407	22.93	1.528	31 32	2 6.1	84 49	5 39.2	1.0686	1.2734	8.11	0.9091
28	0.7435	22.97	1.532	31 18	2 5.2	83 45	5 35.0	1.0684	1.2735	8.10	0.9084
29	0.7462	22.98	1.532	31 10	2 4.7	82 40	5 30.7	1.0678	1.2737	8.08	0.9076
30	0.7490	+22.97	+1.531	31 6	2 4.4	81 36	5 26.4	+1.0674	+1.2739	+8.06	+0.9066
31	0.7517	+22.95	+1.530	31 8	2 4.6	80 32	5 22.1	+1.0671	+1.2741	+8.05	+0.9056

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
Oct. 1	0.7517	+22.95	+1.530	31 8	2 4.6	80 32	5 22.1	+1.0671	+1.2741	+8.05	+0.9056
2	0.7544	22.94	1.529	31 14	2 4.9	79 28	5 17.9	1.0674	1.2743	8.03	0.9044
3	0.7572	22.95	1.530	31 22	2 5.5	78 24	5 13.6	1.0683	1.2745	8.00	0.9030
4	0.7599	23.01	1.534	31 28	2 5.9	77 20	5 9.3	1.0699	1.2748	7.97	0.9015
$(1^{h}.0)$ 5	0.7626	23.11	1.541	31 32	2 6.1	76 16	5 5.1	1.0720	1.2751	7.94	0.8999
6	0.7654	+23.24	+1.549	31 31	2 6.1	75 12	5 0.8	+1.0744	+1.2754	+7.91	+0.8982
7	0.7681	23.39	1.559	31 24	2 5.6	74 8	4 56.5	1.0768	1.2757	7.87	0.8961
8	0.7709	23.56	1.570	31 13	2 4.9	73 4	4 52.3	1.0789	1.2761	7.84	0.8943
9	0.7736	23.71	1.581	30 59	2 3.9	72 0	4 48.0	1.0806	1.2764	7.80	0.8921
10	0.7763	23.84	1.589	30 43	2 2.9	70 57	4 43.8	1.0818	1.2768	7.76	0.8897
11	0.7791	+23.93	+1.595	30 29	2 1.9	69 53	4 39.5	+1.0824	+1.2772	+7.71	+0.8872
12	0.7818	23.99	1.599	30 18	2 1.2	68 50	4 35.3	1.0826	1.2777	7.67	0.8847
13	0.7845	24.02	1.601	30 11	2 0.7	67 46	4 31.1	1.0827	1.2781	7.62	0.8821
14	0.7873	24.04	1.602	30 9	2 0.6	66 43	4 26.9	1.0829	1.2786	7.57	0.8791
15	0.7900	24.06	1.604	30 12	2 0.8	65 40	4 22.6	1.0835	1.2791	7.52	0.8760
16	0.7928	+24.10	+1.606	30 18	2 1.2	64 37	4 18.4	+1.0846	+1.2796	+7.46	+0.8729
17	0.7955	24.16	1.610	30 25	2 1.7	63 34	4 14.2	1.0862	1.2801	7.40	0.8695
18	0.7982	24.27	1.618	30 30	2 2.0	62 31	4 10.1	1.0886	1.2806	7.34	0.8660
19	0.8010	24.41	1.628	30 32	2 2.1	61 28	4 5.9	1.0913	1.2811	7.28	0.8624
20	0.8037	24.58	1.639	30 30	2 2.0	60 25	4 1.7	1.0941	1.2817	7.22	0.8585
$(2^{h}.0)$ 21	0.8064	+24.76	+1.651	30 22	2 1.5	59 23	3 57.5	+1.0968	+1.2822	+7.15	+0.8545
22	0.8092	24.94	1.663	30 11	2 0.7	58 20	3 53.3	1.0991	1.2828	7.08	0.8503
23	0.8119	25.10	1.673	29 58	1 59.8	57 18	3 49.2	1.1008	1.2834	7.00	0.8459
24	0.8147	25.22	1.681	29 44	1 58.9	56 16	3 45.1	1.1019	1.2840	6.94	0.8414
25	0.8174	25.30	1.687	29 32	1 58.2	55 14	3 40.9	1.1025	1.2846	6.87	0.8367
26	0.8201	+25.35	+1.690	29 25	1 57.6	54 12	3 36.8	+1.1027	+1.2852	+6.79	+0.8317
27	0.8229	25.37	1.691	29 22	1 57.4	53 10	3 32.7	1.1028	1.2859	6.71	0.8266
28	0.8256	25.37	1.691	29 23	1 57.6	52 9	3 28.6	1.1030	1.2865	6.63	0.8213
29	0.8284	25.38	1.692	29 29	1 57.9	51 8	3 24.5	1.1036	1.2871	6.54	0.8158
30	0.8311	25.42	1.695	29 37	1 58.5	50 6	3 20.4	1.1048	1.2878	6.46	0.8101
31	0.8338	+25.49	+1.699	29 45	1 59.0	49 5	3 16.3	+1.1066	+1.2884	+6.37	+0.8041
Nov. 1	0.8366	25.60	1.707	29 51	1 59.4	48 4	3 12.3	1.1090	1.2891	6.28	0.7980
2	0.8393	25.76	1.717	29 53	1 59.5	47 3	3 8.2	1.1116	1.2897	6.19	0.7916
3	0.8420	25.94	1.729	29 49	1 59.3	46 2	3 4.2	1.1145	1.2904	6.10	0.7850
4	0.8448	26.13	1.742	29 41	1 58.7	45 2	3 0.1	1.1171	1.2910	6.00	0.7781
$(3^{h}.0)$ 5	0.8475	+26.32	+1.755	29 30	1 58.0	44 2	2 56.1	+1.1194	+1.2917	+5.90	+0.7710
6	0.8503	26.49	1.766	29 16	1 57.1	43 1	2 52.1	1.1212	1.2923	5.80	0.7637
7	0.8530	26.63	1.775	29 2	1 56.1	42 1	2 48.1	1.1225	1.2930	5.70	0.7562
8	0.8557	26.73	1.782	28 51	1 55.4	41 2	2 44.1	1.1234	1.2937	5.60	0.7482
9	0.8585	26.81	1.787	28 43	1 54.9	40 2	2 40.1	1.1240	1.2943	5.50	0.7401
10	0.8612	+26.86	+1.791	28 40	1 54.6	39 2	2 36.1	+1.1247	+1.2950	+5.38	+0.7316
11	0.8639	26.91	1.794	28 40	1 54.7	38 3	2 32.2	1.1256	1.2956	5.28	0.7228
12	0.8667	26.98	1.799	28 44	1 55.0	37 3	2 28.2	1.1270	1.2962	5.17	0.7138
13	0.8694	27.08	1.805	28 50	1 55.3	36 4	2 24.3	1.1289	1.2969	5.06	0.7043
14	0.8722	27.21	1.814	28 55	1 55.6	35 5	2 20.3	1.1313	1.2975	4.95	0.6944
15	0.8749	+27.38	+1.825	28 57	1 55.8	34 6	2 16.4	+1.1342	+1.2981	+4.83	+0.6843
16	0.8776	+27.58	+1.839	28 55	1 55.7	33 7	2 12.5	+1.1373	+1.2987	+4.72	+0.6738

FOR WASHINGTON MEAN MIDNIGHT

Solar Day. (Sid. Hour.)	τ	*f*		*G*		*H*		Log *g*.	Log *h*.	*i*	Log *i*.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
Nov. 16	0.8776	+27.58	+1.839	28 55	1 55.7	33 7	2 12.5	+1.1373	+1.2987	+4.72	+0.6738
17	0.8804	27.80	1.853	28 49	1 55.2	32 9	2 8.6	1.1402	1.2993	4.60	0.6628
18	0.8831	28.02	1.868	28 38	1 54.6	31 10	2 4.7	1.1430	1.2999	4.48	0.6515
19	0.8858	28.23	1.882	28 25	1 53.7	30 12	2 0.8	1.1453	1.3005	4.36	0.6398
($4^{h}.0$) 20	0.8886	28.40	1.893	28 11	1 52.8	29 14	1 56.9	1.1470	1.3011	4.24	0.6274
21	0.8913	+28.54	+1.902	27 58	1 51.9	28 16	1 53.1	+1.1481	+1.3016	+4.12	+0.6146
22	0.8941	28.63	1.909	27 48	1 51.2	27 18	1 49.2	1.1489	1.3022	3.99	0.6013
23	0.8968	28.70	1.913	27 41	1 50.8	26 20	1 45.3	1.1495	1.3027	3.87	0.5875
24	0.8995	28.74	1.916	27 39	1 50.6	25 22	1 41.5	1.1500	1.3032	3.74	0.5730
25	0.9023	28.79	1.919	27 41	1 50.7	24 25	1 37.7	1.1508	1.3037	3.61	0.5573
26	0.9050	+28.85	+1.924	27 45	1 51.0	23 28	1 33.8	+1.1521	+1.3042	+3.48	+0.5418
27	0.9078	28.95	1.930	27 50	1 51.4	22 30	1 30.0	1.1539	1.3047	3.35	0.5250
28	0.9105	29.09	1.939	27 54	1 51.6	21 33	1 26.2	1.1562	1.3051	3.22	0.5076
29	0.9132	29.27	1.951	27 54	1 51.6	20 36	1 22.4	1.1589	1.3056	3.08	0.4893
30	0.9160	29.48	1.965	27 51	1 51.4	19 39	1 18.6	1.1617	1.3060	2.95	0.4701
Dec. 1	0.9187	+29.70	+1.980	27 42	1 50.8	18 42	1 14.8	+1.1645	+1.3064	+2.82	+0.4497
2	0.9214	29.93	1.995	27 30	1 50.0	17 45	1 11.0	1.1670	1.3068	2.68	0.4281
3	0.9242	30.15	2.010	27 16	1 49.0	16 48	1 7.2	1.1691	1.3072	2.54	0.4055
4	0.9269	30.33	2.022	27 0	1 48.0	15 51	1 3.4	1.1708	1.3076	2.41	0.3815
($5^{h}.0$) 5	0.9297	30.48	2.032	26 46	1 47.1	14 55	0 59.6	1.1719	1.3079	2.27	0.3558
6	0.9324	+30.60	+2.040	26 35	1 46.3	13 58	0 55.9	+1.1729	+1.3082	+2.13	+0.3284
7	0.9351	30.69	2.046	26 27	1 45.8	13 2	0 52.1	1.1737	1.3085	1.99	0.2989
8	0.9379	30.77	2.051	26 23	1 45.6	12 5	0 48.3	1.1747	1.3088	1.85	0.2672
9	0.9406	30.86	2.058	26 23	1 45.5	11 8	0 44.6	1.1759	1.3091	1.71	0.2328
10	0.9433	30.98	2.065	26 24	1 45.6	10 12	0 40.8	1.1776	1.3093	1.57	0.1953
11	0.9461	+31.13	+2.075	26 26	1 45.7	9 16	0 37.1	+1.1798	+1.3095	+1.43	+0.1541
12	0.9488	31.32	2.088	26 25	1 45.7	8 20	0 33.3	1.1824	1.3097	1.28	0.1084
13	0.9516	31.54	2.103	26 22	1 45.5	7 23	0 29.6	1.1853	1.3099	1.14	0.0569
14	0.9543	31.78	2.119	26 15	1 45.0	6 27	0 25.8	1.1882	1.3101	1.00	9.9987
15	0.9570	32.03	2.135	26 4	1 44.2	5 31	0 22.1	1.1909	1.3102	0.85	9.9310
16	0.9598	+32.27	+2.151	25 49	1 43.3	4 35	0 18.3	+1.1932	+1.3103	+0.71	+9.8508
17	0.9625	32.48	2.165	25 34	1 42.2	3 39	0 14.6	1.1951	1.3104	0.56	9.7522
18	0.9652	32.65	2.177	25 18	1 41.2	2 43	0 10.9	1.1964	1.3105	0.42	9.6242
19	0.9680	32.78	2.186	25 4	1 40.3	1 47	0 7.1	1.1973	1.3105	0.28	9.4415
20	0.9707	32.88	2.192	24 53	1 39.5	0 51	0 3.4	1.1979	1.3106	+0.13	+9.1196
($6^{h}.0$) 21	0.9735	+32.95	+2.197	24 46	1 39.1	359 55	23 59.7	+1.1984	+1.3106	−0.01	−8.1139
22	0.9762	33.01	2.201	24 43	1 38.9	358 59	23 55.9	1.1991	1.3106	0.16	9.1981
23	0.9789	33.08	2.206	24 43	1 38.8	358 3	23 52.2	1.2000	1.3105	0.30	9.4806
24	0.9817	33.19	2.212	24 44	1 38.9	357 7	23 48.4	1.2014	1.3105	0.45	9.6502
25	0.9844	33.32	2.221	24 44	1 39.0	356 11	23 44.7	1.2033	1.3104	0.59	9.7720
26	0.9872	+33.50	+2.233	24 43	1 38.9	355 14	23 41.0	+1.2055	+1.3103	−0.74	−9.8668
27	0.9899	33.71	2.248	24 38	1 38.5	354 18	23 37.2	1.2079	1.3102	0.88	9.9445
28	0.9926	33.95	2.263	24 29	1 37.9	353 22	23 33.5	1.2104	1.3101	1.02	0.0100
29	0.9954	34.19	2.279	24 16	1 37.1	352 26	23 29.7	1.2127	1.3099	1.17	0.0672
30	0.9981	34.41	2.294	24 1	1 36.1	351 29	23 26.0	1.2147	1.3097	1.31	0.1174
31	1.0008	+34.61	+2.307	23 44	1 34.9	350 33	23 22.2	+1.2163	+1.3095	−1.45	−0.1624
32	1.0036	+34.78	+2.317	23 28	1 33.9	349 37	23 18.4	+1.2174	+1.3093	−1.60	−0.2029

MEAN PLACES FOR 1887.0. (January $0^d.0$—$0^d.047$, Washington.)

Name of Star.		Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
			h	m	s	s	°	′	″	″
α Andromedæ		2.0	0	2	32.842	+ 3.0909	+ 28	27	59.42	+ 19.885
* β Cassiopeæ		2.0	0	3	9.076	3.1728	+ 58	31	34.25	19.852
* 22 Andromedæ		5.3	0	4	26.974	3.1015	+ 45	26	35.58	20.036
4 Draconis (H.)	S. P.	4.7	0	6	54.130	2.8889	+101	45	20.96	20.023
γ Pegasi (*Algenib*)		2.7	0	7	25.037	3.0834	+ 14	33	18.98	20.024
* σ Andromedæ		4.3	0	12	25.551	+ 3.1224	+ 36	9	30.99	+ 19.984
* ι Ceti		3.3	0	13	40.069	3.0529	− 9	27	2.38	19.958
* 6 Ursæ Minoris	S. P.	6.0	0	14	19.952	0.1300	+ 91	40	24.75	19.941
* 44 Piscium		6.0	0	19	36.590	3.0731	+ 1	18	49.76	19.954
β Hydri		3.0	0	19	47.848	3.2348	− 77	53	26.65	20.286
12 Ceti		6.0	0	24	16.305	+ 3.0610	− 4	34	54.28	+ 19.940
κ Draconis	S. P.	3.3	0	28	39.448	2.5932	+109	35	19.88	19.891
* π Andromedæ		4.0	0	30	50.765	3.1900	+ 33	5	49.53	19.876
α Cassiopeæ (*var.*)		2.5	0	34	5.931	3.3724	+ 55	55	2.66	19.791
β Ceti		2.0	0	37	55.049	3.0144	− 18	36	25.53	19.804
21 Cassiopeæ		6.0	0	38	11.652	+ 3.8536	+ 74	22	12.81	+ 19.755
* υ Cassiopeæ		5.0	0	38	25.789	3.3181	+ 47	39	56.46	19.757
* δ Piscium		4.3	0	42	49.167	3.1072	+ 6	58	11.52	19.652
32^2 Camelop. (H.)	S. P.	4.7	0	48	18.286	0.3875	+ 95	58	22.45	19.597
* γ Cassiopeæ		2.0	0	49	53.546	3.5772	+ 60	6	16.26	19.567
* μ Andromedæ		4.0	0	50	28.923	+ 3.3103	+ 37	53	10.62	+ 19.621
* 43 Cephei (H.)		4.3	0	53	26.531	7.2016	+ 85	39	1.50	19.510
ε Piscium		4.0	0	57	4.712	3.1088	+ 7	16	53.51	19.458
β Andromedæ		2.3	1	3	24.394	3.3435	+ 35	1	16.22	19.169
* f Piscium		5.0	1	11	58.193	3.0895	+ 3	1	8.63	19.038
* κ Tucanæ		5.0	1	11	56.244	+ 2.0557	− 69	28	34.67	+ 19.173
α Ursæ Minoris (*Polaris*)		2.0	1	17	21.936	22.8044	+ 88	42	21.70	18.921
θ^1 Ceti		3.0	1	18	22.498	2.9970	− 8	46	0.16	18.672
* κ Octantis	S. P.	5.0	1	22	48.603	8.6319	− 94	47	38.67	18.789
38 Cassiopeæ		6.3	1	22	49.799	4.3742	+ 69	40	57.24	18.682
η Piscium		3.7	1	25	26.217	+ 3.2022	+ 14	45	46.80	+ 18.669
* υ Andromedæ		4.0	1	30	10.013	3.5034	+ 40	50	24.13	18.150
* π Piscium		5.7	1	31	6.494	3.1701	+ 11	33	47.78	18.531
α Eridani (*Achernar*)		1.0	1	33	30.000	2.2327	− 57	48	39.89	18.360
* ν Piscium		4.7	1	35	33.057	3.1176	+ 4	54	55.62	18.335
ο Piscium		4.3	1	39	25.609	+ 3.1620	+ 8	35	18.62	+ 18.222
* ξ Ceti		3.0	1	45	52.962	2.9617	− 10	53	40.43	17.829
β Arietis		3.0	1	48	23.879	3.3031	+ 20	15	18.90	17.734
50 Cassiopeæ		4.0	1	53	47.814	5.0066	+ 71	52	25.95	17.655
* γ Andromedæ		2.3	1	56	57.868	3.6594	+ 41	47	13.07	17.449
α Arietis		2.0	2	0	48.235	+ 3.3705	+ 22	55	39.51	+ 17.179
α Draconis	S. P.	3.3	2	1	19.859	1.6236	+115	5	2.39	17.302
* β Trianguli		3.0	2	2	49.268	3.5538	+ 34	27	8.23	17.211
ξ^1 Ceti		4.3	2	7	0.665	+ 3.1738	+ 8	18	58.16	17.037
* 4 Ursæ Minoris	S. P.	5.0	2	9	17.997	− 0.3265	+101	55	17.23	16.908
* γ Trianguli		4.3	2	10	35.855	+ 3.5502	+ 33	19	26.65	+ 16.852
* 67 Ceti		6.0	2	11	20.802	2.9892	− 6	56	36.37	16.739
ι Cassiopeæ		4.0	2	19	45.568	4.8590	+ 66	53	36.89	16.443
* δ Hydri		4.0	2	19	44.452	1.0540	− 69	10	25.31	16.453
ξ^2 Ceti		4.0	2	22	9.088	+ 3.1834	+ 7	57	10.84	+ 16.303

***Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.**

MEAN PLACES FOR 1887.0. (January 0^d.0—0^d.047, Washington.)

Name of Star.		Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
			h m s	s	° ′ ″	″
5 Ursæ Minoris .	S. P.	4.7	2 27 46.373	− 0.1931	+103 48 6.12	+ 16.011
* δ Ceti . . .		4.0	2 33 41.451	+ 3.0726	− 0 9 34.75	15.704
* μ Hydri . . .		6.0	2 34 4.853	− 1.4418	− 79 36 7.28	15.678
* θ Persei . . .		4.0	2 36 29.061	+ 4.0685	+ 48 44 59.04	15.464
γ Ceti . . .		3.3	2 37 26.717	3.1030	+ 2 45 32.53	15.347
* σ Arietis . . .		5.7	2 45 15.248	+ 3.3041	+ 14 36 56.72	+ 15.017
* 47 Cephei (H.) . .		6.0	2 51 5.677	+ 7.7109	+ 78 58 14.09	14.715
β Ursæ Minoris .	S. P.	2.0	2 51 2.522	− 0.2335	+105 22 57.80	14.719
* ε Arietis . . .		4.3	2 52 45.066	+ 3.4206	+ 20 53 16.08	14.615
α Ceti . . .		2.3	2 56 22.348	3.1301	+ 3 38 44.91	14.317
* β Persei (*Algol*) (*var.*)		2.7	3 0 49.045	+ 3.8828	+ 40 31 9.94	+ 14.131
48 Cephei (H.) . .		6.3	3 6 0.488	7.3982	+ 77 19 4.76	13.751
ζ Arietis . . .		4.7	3 8 24.397	3.4389	+ 20 37 29.92	13.566
α Persei . . .		2.0	3 16 15.489	4.2563	+ 49 27 29.03	13.105
* ρ Octantis . .	S. P.	6.0	3 17 21.982	+12.9442	− 95 54 51.93	13.021
* ι Hydri . . .		5.0	3 18 47.472	− 1.6030	− 77 48 2.49	+ 13.022
γ² Ursæ Minoris .	S. P.	3.0	3 20 54.814	− 0.1355	+107 45 50.11	12.811
* f Tauri . . .		4.0	3 24 38.050	+ 3.3046	+ 12 32 55.51	12.753
ε Eridani . . .		3.0	3 27 36.389	2.8235	− 9 50 28.19	12.402
δ Persei . . .		3.3	3 34 52.902	4.2490	+ 47 25 30.73	11.823
* γ Camelopardalis (H.).		4.3	3 38 26.412	+ 6.2345	+ 70 58 57.35	+ 11.564
η Tauri . . .		3.0	3 40 46.040	3.5564	+ 23 45 17.53	11.391
ζ Persei . . .		3.0	3 47 1.774	+ 3.7597	+ 31 32 49.43	10.962
ζ Ursæ Minoris .	S. P.	4.3	3 48 6.701	− 2.2563	+101 51 30.01	10.915
* γ Hydri . . .		3.3	3 48 59.749	− 0.9993	− 74 35 6.18	10.978
* ε Persei . . .		3.3	3 50 16.263	+ 4.0092	+ 39 40 56.38	+ 10.735
γ Eridani . . .		3.0	3 52 45.475	2.7984	− 13 49 50.29	10.455
* A¹ Tauri . . .		4.7	3 58 0.918	3.5395	+ 21 46 19.57	10.095
* c Persei . . .		4.0	4 0 27.559	4.3362	+ 47 24 34.91	9.955
Groombr. 2320 .	S. P.	6.3	4 6 0.765	0.1388	+111 53 31.37	9.499
* o¹ Eridani . . .		4.3	4 6 20.971	+ 2.9266	− 7 7 58.87	+ 9.626
γ Tauri . . .		4.0	4 13 21.782	+ 3.4087	+ 15 21 14.19	8.970
* η Ursæ Minoris .	S. P.	5.0	4 20 48.926	− 1.8192	+103 59 4.55	8.156
ε Tauri . . .		3.7	4 22 1.096	+ 3.4971	+ 18 55 44.02	8.270
η Draconis . .	S. P.	2.7	4 22 27.836	0.8059	+118 13 47.66	8.225
* m Persei . . .		6.0	4 25 27.918	+ 4.2094	+ 42 49 16.78	+ 8.020
* δ Mensæ . . .		6.0	4 25 38.352	− 4.2306	− 80 28 39.32	8.030
A Draconis . .	S. P.	5.0	4 28 12.581	− 0.1359	+110 59 15.28	7.798
α Tauri (*Aldebaran*) .		1.0	4 29 26.201	+ 3.4371	+ 16 16 52.46	7.528
* τ Tauri . . .		4.3	4 35 27.775	3.5950	+ 22 44 20.89	7.198
α Camelopardalis .		4.7	4 42 49.043	+ 5.9233	+ 66 8 56.81	+ 6.625
* i Tauri . . .		5.3	4 44 45.830	3.5051	+ 18 38 47.51	6.420
ι Aurigæ . . .		3.0	4 49 38.114	3.9003	+ 32 59 10.15	6.039
* ζ Aurigæ . . .		4.0	4 54 34.788	+ 4.1846	+ 40 54 35.16	5.641
ε Ursæ Minoris .	S. P.	4.3	4 57 34.614	− 0.3391	+ 97 46 41.64	5.397
11 Orionis . . .		5.0	4 58 6.706	+ 3.4242	+ 15 14 44.78	+ 5.311
* β Eridani . . .		3.0	5 2 17.669	2.9484	− 5 13 59.85	4.938
α Aurigæ (*Capella*) .		1.0	5 8 20.516	4.4243	+ 45 52 54.58	4.047
β Orionis (*Rigel*) .		1.0	5 9 6.434	2.8812	− 8 19 58.74	4.411
* τ Orionis . . .		4.0	5 12 7.167	+ 2.9125	− 6 58 2.86	+ 4.148

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MEAN PLACES FOR 1887.0. (January 0d.0—0d.047, Washington.)

	Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
			h m s	s	° ′ ″	″
	β Tauri . . .	2.0	5 19 8.929	+ 3.7890	+ 28 30 39.38	+ 3.375
	Groombridge 966 .	6.3	5 24 37.555	7.9989	+ 74 58 0.46	3.102
*	χ Aurigæ . . .	5.0	5 25 22.463	3.9048	+ 32 6 27.62	3.039
*	Groombridge 944 .	6.3	5 25 52.405	18.6367	+ 85 8 13.70	2.986
	δ Orionis (*var.*) . .	2.5	5 26 14.019	3.0632	— 0 23 1.12	2.939
	α Leporis . . .	3.0	5 27 44.784	+ 2.6447	— 17 54 14.04	+ 2.812
	ε Orionis . . .	2.0	5 30 28.766	3.0423	— 1 16 29.71	2.577
	α Columbæ . .	2.0	5 35 33.494	+ 2.1727	— 34 8 5.92	2.090
	ω Draconis . . S. P.	5.0	5 37 36.864	— 0.3541	+111 11 23.80	1.632
*	κ Orionis . . .	2.7	5 42 23.806	+ 2.8447	— 9 42 38.07	1.542
*	ν Aurigæ . . .	4.0	5 43 39.456	+ 4.1542	+ 39 6 51.10	+ 1.465
	ψ^1 Draconis . . S. P.	4.3	5 43 56.915	— 1.0796	+107 47 45.76	1.676
*	δ Doradus . . .	4.3	5 44 34.440	+ 0.1046	— 65 46 40.20	1.329
	α Orionis (*var.*) . .	1.2	5 49 3.244	3.2469	+ 7 23 6.26	0.965
*	β Aurigæ . . .	2.0	5 51 14.406	4.4016	+ 44 56 4.73	0.756
*	θ Aurigæ . . .	3.0	5 52 0.980	+ 4.0919	+ 37 12 12.84	+ 0.610
	ν Orionis . . .	4.7	6 1 7.262	3.4273	+ 14 46 51.55	— 0.128
	22 Camelopardalis (H.)	4.7	6 6 23.351	6.6176	+ 69 21 27.65	0.677
*	η Geminorum . .	3.3	6 8 3.431	+ 3.6227	+ 22 32 18.92	0.721
	δ Ursæ Minoris . S. P.	4.3	6 8 46.030	—19.4595	+ 93 23 20.57	0.818
	μ Geminorum . .	3.0	6 16 7.480	+ 3.6315	+ 22 34 13.92	— 1.531
*	ψ^1 Aurigæ . . .	5.3	6 16 11.737	4.6266	+ 49 20 39.41	1.426
	α Argus (*Canopus*) .	1.0	6 21 26.695	1.3304	— 52 38 3 07	1.865
*	ν Geminorum . .	4.7	6 22 15.201	+ 3.5631	+ 20 16 57.56	1.966
*	χ Draconis . . S. P.	4.0	6 23 5.573	— 1.0794	+107 18 59.45	1.641
	γ Geminorum . .	2.3	6 31 11.040	+ 3.4674	+ 16 29 41.24	— 2.768
*	ε Geminorum . .	3.3	6 36 58.766	3.6935	+ 25 14 31.29	3.235
*	ψ^5 Aurigæ . . .	5.7	6 38 35.589	4.3292	+ 43 41 19.40	3.213
†	α Canis Majoris (*Sirius*)	1.0	6 40 10.127	2.6437	— 16 33 42.59	4.704
*	θ Geminorum . .	3.3	6 45 20.489	3.9610	+ 34 5 47.50	3.973
	51 Cephei (H.) . .	5.3	6 47 15.649	+29.9640	+ 87 13 17.06	— 4.198
*	ζ Mensæ . . .	5.8	6 49 26.190	— 4.8972	— 80 41 34.64	4.211
	50 Draconis . S. P.	6.0	6 50 0.780	— 1.9066	+104 41 59.14	4.416
	ε Canis Majoris . .	1.7	6 54 11.116	+ 2.3577	— 28 49 8.41	4.710
*	ζ Geminorum (*var.*) .	4.0	6 57 24.435	3.5625	+ 20 44 6.19	4.989
	δ Canis Majoris . .	2.0	7 3 47.800	+ 2.4384	— 26 12 51.57	— 5.501
*	63 Aurigæ . . .	5.0	7 3 52.953	4.1369	+ 39 30 14.15	5.499
*	25 Camelopardalis .	4.7	7 7 15.763	+12.9710	+ 82 37 34.00	5.831
*	γ^2 Volantis (*var.*) .	4.7	7 9 42.374	— 0.4862	— 70 18 53.81	5.865
	δ Draconis . . S. P.	3.0	7 12 31.650	+ 0.0301	+112 32 14.04	6.326
	δ Geminorum . .	3.3	7 13 22.456	+ 3.5881	+ 22 11 22.03	— 6.327
	τ Draconis . . S. P.	4.7	7 17 43.370	— 1.1156	+106 51 16.47	6.779
	Piazzi vii. 67 . .	6.0	7 19 7.091	+ 6.3007	+ 68 41 41.84	6.824
*	β Canis Minoris . .	3.0	7 21 1.374	3.2598	+ 8 30 58.04	6.980
	α^2 Geminorum (*Castor*)	1.7	7 27 23.417	3.8388	+ 32 8 7.79	7.540
†	α Canis Min. (*Procyon*)	1.0	7 33 23.191	+ 3.1436	+ 5 30 49.73	— 8.983
	β Geminorum (*Pollux*)	1.3	7 38 24.059	+ 3.6797	+ 28 17 53.68	8.404
	λ Ursæ Minoris . S. P.	6.3	7 36 48.510	—64.1900	+ 91 2 23.75	8.231
*	26 Lyncis . . .	6.0	7 46 28.934	+ 4.3889	+ 47 51 23.02	9.006
*	Groombridge 1374 .	5.7	7 46 39.130	+ 7.2905	+ 74 13 4.89	— 9.032

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

† Periodic corrections given in the Appendix are still to be applied to the positions of Sirius and Procyon.

MEAN PLACES FOR 1887.0. (January 0ᵈ.0—0ᵈ.047, Washington.)

	Name of Star.		Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
				h	m	s	s	°	′	″	″
	φ Geminorum		5.0	7	46	34.884	+ 3.6803	+ 27	3	26.87	— 9.017
	ε Draconis	S. P.	3.7	7	48	32.992	— 0.1781	+110	1	11.51	9.174
*	ω^1 Cancri		6.0	7	54	5.643	+ 3.6376	+ 25	42	5.26	9.567
	3 Ursæ Majoris (H.)		5.7	8	1	33.682	6.0519	+ 68	48	19.03	10.142
	15 Argus		3.0	8	2	43.906	2.5544	— 23	58	44.74	10.187
*	ζ^1 Cancri		4.7	8	5	43.855	+ 3.4467	+ 17	59	13.93	— 10.593
*	β Cancri		3.7	8	10	23.204	+ 3.2587	+ 9	31	58.62	10.847
	κ Cephei (*pr.*)	S. P.	4.3	8	12	40.723	— 1.9191	+102	37	45.40	11.000
*	30 Monocerotis		3.7	8	20	0.822	+ 3.0001	— 3	32	18.22	11.498
*	θ Chamæleontis		4.7	8	24	0.743	— 1.7062	— 77	7	10.20	11.766
	η Cancri		5.7	8	26	10.459	+ 3.4786	+ 20	49	27.47	— 11.994
	Groombr. 3241	S. P.	6.3	8	30	29.319	— 0.2182	+107	51	4.32	12.222
*	σ Hydræ		5.0	8	32	51.149	+ 3.1460	+ 3	44	14.89	12.425
*	γ Cancri		4.3	8	36	44.789	3.4808	+ 21	52	26.85	12.715
	ε Hydræ		3.3	8	40	47.523	3.1820	+ 6	49	57.88	12.996
*	σ^2 Cancri (*mean*)		5.7	8	47	20.959	+ 3.6740	+ 31	0	23.91	— 13.398
	ι Ursæ Majoris		3.0	8	51	28.065	+ 4.1344	+ 48	29	4.45	13.894
	12 Year Cat. 1879	S. P.	6.0	8	52	41.289	— 2.5414	+ 99	52	19.21	13.690
	σ^2 Ursæ Majoris		5.0	9	0	26.444	+ 5.3580	+ 67	35	32.57	14.262
	κ Cancri		5.0	9	1	37.622	3.2561	+ 11	7	20.75	14.283
*	θ Hydræ		4.0	9	8	29.130	+ 3.1263	+ 2	47	25.45	— 15.010
*	β Argus		1.5	9	11	57.378	0.6786	— 69	15	6.41	14.804
	ι Argus		2.0	9	14	3.771	1.6012	— 58	48	3.60	14.994
*	α Lyncis		3.3	9	14	10.140	3.6698	+ 34	52	10.53	15.018
	α Cephei	S. P.	2.7	9	15	52.946	1.4367	+117	53	35.06	15.169
	1 Draconis (H.)		4.3	9	20	54.747	+ 9.0183	+ 81	49	28.26	— 15.431
	α Hydræ		2.0	9	22	2.077	2.9491	+ 8	10	9.45	15.445
	d Ursæ Majoris		4.7	9	24	28.516	5.4049	+ 70	19	33 99	15.550
	θ Ursæ Majoris		3.0	9	25	17.672	4.0425	+ 52	11	29.98	16.210
	β Cephei (*pr.*)	S. P.	3.0	9	27	11.922	0.7949	+109	56	7.19	15.755
*	10 Leonis Minoris		4.7	9	27	17.988	+ 3.6948	+ 36	53	55.37	— 15.775
*	ο Leonis		3.7	9	35	7.161	+ 3.2071	+ 10	24	21.25	16.216
*	ζ Chamæleontis		5.0	9	37	11.056	— 1.5553	— 80	26	0.11	16.290
	ε Leonis		3.0	9	39	26.186	+ 3.4155	+ 24	17	38.57	16.420
	11 Cephei	S. P.	5.0	9	40	15.928	0.9021	+109	12	31.56	16.537
	μ Leonis		4.0	9	46	20.173	+ 3.4225	+ 26	32	19.32	— 16.790
*	19 Leonis Minoris		5.3	9	50	45.717	3.6962	+ 41	35	35.74	16.956
	79 Draconis	S. P.	6.3	9	51	27.448	0.7304	+106	49	55.98	17.012
*	π Leonis		5.0	9	54	14.504	3.1745	+ 8	35	9.34	17.134
	α Leonis (*Regulus*)		1.3	10	2	21.227	3.2009	+ 12	31	8.78	17.469
	32 Ursæ Majoris		6.0	10	9	49.181	+ 4.4236	+ 65	40	17.14	— 17.806
*	λ Ursæ Majoris		3.3	10	10	16.762	3.6405	+ 43	28	40.77	17.868
	γ^1 Leonis		2.0	10	13	44.525	3.3152	+ 20	24	46.02	18.082
*	μ Hydræ		4.0	10	20	37.569	2.9006	— 16	15	36.07	18.307
*	β Leonis Minoris		4.3	10	21	20.859	3.4873	+ 37	17	9.32	18.310
*	α Antliæ		4.0	10	21	58.859	+ 2.7389	— 30	29	35.16	— 18.214
	9 Draconis (H.)		4.7	10	25	28.469	5.2696	+ 76	17	40.29	18.387
	ρ Leonis		4.0	10	26	51.691	3.1643	+ 9	53	15.85	18.429
	226 Cephei (B.)	S. P.	5.3	10	30	17.303	1.0783	+104	21	21.22	18.527
*	β Octantis	S. P.	4.7	10	34	27.011	+ 6.5005	— 98	1	36.63	— 18.674

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MEAN PLACES FOR 1887.0. (January 0ᵈ.0—0ᵈ.047, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
* 41 Leonis Minoris	5.7	10 37 16.271	+ 3.2712	+ 23 46 46.91	— 18.735
η Argus (*var.*)	1–6	10 40 40.650	2.3129	— 59 5 26 09	18.868
l Leonis	5.3	10 43 19.069	3.1587	+ 11 8 34.34	18.970
* δ² Chamæleontis	5.0	10 44 42.500	0.6093	— 79 56 39.71	19.003
ι Cephei S. P.	3.8	10 45 39.436	2.1213	+114 23 37.98	18.875
* 46 Leonis Minoris	4.0	10 46 59.450	+ 3.3702	+ 34 49 26.37	— 19.292
* Groombridge 1706	6.0	10 50 53.421	4.9776	+ 78 22 31.00	19.176
α Ursæ Majoris	2.0	10 56 44.895	+ 3.7494	+ 62 21 39.08	19.361
* η Octantis	6.0	11 0 4.021	— 0.2884	— 83 59 10.26	19.409
* *p*³ Leonis	6.0	11 1 8.382	+ 3.0621	+ 2 34 6.92	19.485
* ψ Ursæ Majoris	3.3	11 3 18.488	+ 3.3942	+ 45 6 40.12	— 19.502
δ Leonis	2.3	11 8 5.906	3.1986	+ 21 8 33.47	19.684
* ν Ursæ Majoris	3.3	11 12 22.580	3.2583	+ 33 42 38.80	19.571
δ Crateris	3.3	11 13 41.505	2.9962	— 14 10 2.21	19.462
ο Cephei S. P.	5.3	11 13 59.336	2.4430	+112 30 23.78	19.668
τ Leonis	5.0	11 22 7.556	+ 3.0862	+ 3 28 42.38	— 19.802
λ Draconis	3.3	11 24 41.130	3.6241	+ 69 57 16.65	19.836
* ξ Hydræ	4.0	11 27 26.654	2.9425	— 31 13 57.29	19.885
υ Leonis	5.0	11 31 9.789	3.0713	— 0 12 0.01	19.860
γ Cephei S. P.	3.3	11 34 42.721	2.4136	+102 59 54.25	20.075
* χ Ursæ Majoris	3.7	11 40 4.904	+ 3.1914	+ 48 24 21.14	— 19.961
β Leonis	2.0	11 43 17.738	3.0642	+ 15 12 13.21	20.119
γ Ursæ Majoris	2.3	11 47 53.117	3.1829	+ 54 19 22.54	20.027
Groombr. 4163 S. P.	7.0	11 49 20.617	2.8629	+106 13 6.70	20.022
* π Virginis	4.3	11 55 4.925	3.0752	+ 7 14 39.88	20.088
ο Virginis	4.0	11 59 27.167	+ 3.0577	+ 9 21 38.18	— 20.015
* ε Corvi	3.0	12 4 18.915	3.0793	— 21 59 29.66	20.041
4 Draconis (H.)	4.7	12 6 54.130	2.8889	+ 78 14 39.04	20.023
γ Corvi	2.0	12 9 59.728	3.0793	— 16 54 52.15	20.018
* 2 Canum Venaticorum	5.3	12 10 27.757	3.0226	+ 41 17 21.65	20.066
β Chamæleontis	5.0	12 11 44.083	+ 3.3957	— 78 41 4.39	— 19.990
η Virginis	3.3	12 14 7.494	3.0685	— 0 2 19.79	20.043
* 6 Ursæ Minoris	6.0	12 14 19.952	0.1310	+ 88 19 35.25	19.941
α¹ Crucis	1.0	12 20 18.292	3.2759	— 62 28 21.99	20.016
* δ² Corvi	2.3	12 24 1.183	3.1022	— 15 53 9.76	20.086
* β Canum Venaticorum	4.3	12 28 22.537	+ 2.8600	+ 41 58 17.54	— 19.617
ζ Corvi	2.3	12 28 27.123	3.1412	— 22 46 18.37	19.964
κ Draconis	3.3	12 28 39.448	2.5932	+ 70 24 40.12	19.891
* γ Virginis (*mean*)	2.7	12 35 56.097	3.0382	— 0 49 46.95	19.815
21 Cassiopeæ S. P.	6.0	12 38 11.652	3.8536	+105 37 47.19	19.755
* 31 Coronæ Borealis	5.0	12 46 11.735	+ 2.9304	+ 28 9 20.26	— 19.664
32² Camelopardalis (H.)	4.7	12 48 18.286	0.3875	+ 84 1 37.55	19.597
* γ Cassiopeæ S. P.	2.0	12 49 53.546	3.5772	+119 53 43.74	19.567
α Canum Venaticorum	2.7	12 50 44.514	2.8159	+ 38 55 43.47	19.515
* 43 Cephei (H.) S. P.	4.3	12 53 26.532	7.2016	+ 94 20 58.50	19.510
* δ Muscæ	4.0	12 54 30.523	+ 4.0308	— 70 56 19.69	— 19.480
* ε Virginis	2.7	12 56 33.139	2.9880	+ 11 33 59.87	19.420
θ Virginis	4.3	13 4 5.947	3.1009	— 4 56 7.98	19.316
* 20 Canum Venaticorum	4.7	13 12 28.507	2.6971	+ 41 10 3.61	19.039
α Urs. Min. (*Polaris*) S. P.	2.0	13 17 21.936	+22.8045	+ 91 17 38.29	— 18.921

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MEAN PLACES FOR 1887.0. (January $0^d.0$—$0^d.047$, Washington.)

Name of Star.		Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
			h	m	s	s	°	′	″	″
α Virginis (*Spica*) .		1.0	13	19	14.405	+ 3.1534	− 10	34	16.65	− 18.904
* κ Octantis . . .		5.0	13	22	48.603	8.6319	− 85	12	21.33	18.789
38 Cassiopeæ .	S. P.	6.3	13	22	49.799	4.3742	+110	19	2.76	18.682
ζ Virginis . . .		3.3	13	28	56.116	3.0529	− 0	1	4.36	18.522
* B. A. C. 4536 . .		5.0	13	29	45.021	2.6825	+ 37	45	41.43	18.543
* m Virginis . . .		6.0	13	35	40.888	+ 3.1429	− 8	7	56.84	− 18.294
η Ursæ Majoris . .		2.0	13	43	5.297	2.3715	+ 49	52	38.69	18.083
η Bootis . . .		3.0	13	49	18.267	2.8568	+ 18	57	52.16	18.176
50 Cassiopeæ .	S. P.	4.0	13	53	47.814	5.0066	+108	7	34.05	17.655
* θ Apodis . . .		5.0	13	54	20.825	5.5675	− 76	15	0.70	17.602
β Centauri . . .		1.0	13	55	51.121	+ 4.1756	− 59	49	38.53	− 17.598
* π Hydræ . . .		3.7	13	59	56.358	3.4072	− 26	8	15.92	17.510
α Draconis . . .		3.3	14	1	19.859	1.6236	+ 64	54	57.61	17.302
* d Bootis . . .		5.0	14	5	14.757	2.7388	+ 25	37	38.11	17.207
* κ Virginis . . .		4.3	14	6	52.106	3.1935	− 9	44	50.64	16.935
* δ Octantis . . .		5.0	14	8	54.439	+ 8.9527	− 83	8	55.16	− 16.972
* 4 Ursæ Minoris . .		5.0	14	9	17.997	− 0.3265	+ 78	4	42.77	16.908
α Bootis (*Arcturus*) .		1.0	14	10	30.450	+ 2.7349	+ 19	46	15.76	18.889
* λ Bootis . . .		4.0	14	12	5.260	2.2829	+ 46	36	26.78	16.665
* λ Virginis . . .		4.7	14	12	59.754	3.2376	− 12	51	1.92	16.736
ι Cassiopeæ .	S. P.	4.0	14	19	45.568	+ 4.8590	+113	6	23.11	+ 16.443
θ Bootis . . .		4.0	14	21	21.052	2.0442	+ 52	22	23.79	16.766
ρ Bootis . . .		3.7	14	26	57.661	+ 2.5878	+ 30	52	3.87	15.967
5 Ursæ Minoris . .		4.7	14	27	46.373	− 0.1931	+ 76	11	53.88	16.011
$α^2$ Centauri . . .		1.0	14	31	56.909	+ 4.0442	− 60	22	16.48	15.385
* α Apodis . . .		4.7	14	33	51.759	+ 7.1720	− 78	33	48.35	− 15.715
* μ Hydri . .	S. P.	6.0	14	34	4.853	− 1.4418	−100	23	52.72	15.678
* 33 Bootis . . .		5.3	14	34	37.905	+ 2.2344	+ 44	53	32.57	15.717
ε Bootis . . .		2.3	14	40	3.179	2.6214	+ 27	33	3.47	15.349
$α^2$ Libræ . . .		2.3	14	44	37.634	3.3091	− 15	34	18.02	15.177
* 47 Cephei (H.) .	S. P.	6.0	14	51	5.677	+ 7.7109	+101	1	45.91	− 14.715
β Ursæ Minoris . .		2.0	14	51	2.522	− 0.2335	+ 74	37	2.20	14.719
* γ Scorpii . . .		3.3	14	57	27.486	+ 3.5015	− 24	50	13.61	14.366
β Bootis . . .		3.0	14	57	41.397	2.2601	+ 40	50	11.69	14.368
48 Cephei (H.) .	S. P.	6.3	15	6	0.488	7.3982	+102	40	55.24	13.751
β Libræ . . .		2.0	15	10	55.589	+ 3.2215	− 8	57	55.47	− 13.519
* δ Bootis . . .		3.0	15	10	56.864	2.4209	+ 33	44	12.98	13.591
* ρ Octantis . . .		6.0	15	17	21.982	12.9442	− 84	5	8.07	13.021
$μ^1$ Bootis . . .		4.0	15	20	13.319	+ 2.2662	+ 37	46	26.10	12.787
$γ^2$ Ursæ Minoris . .		3.0	15	20	54.814	− 0.1355	+ 72	14	9.89	12.811
* β Coronæ Borealis .		4.0	15	23	10.232	+ 2.4751	+ 29	29	46.92	− 12.602
α Coronæ Borealis .		2.0	15	29	54.237	2.5393	+ 27	5	43.57	12.314
* γ Camelop. (H.) .	S. P.	4.3	15	38	26.412	6.2345	+109	1	2.65	11.564
α Serpentis . . .		2.3	15	38	42.132	2.9514	+ 6	46	53.89	11.561
ε Serpentis . . .		3.3	15	45	11.008	+ 2.9870	+ 4	49	6.65	11.059
ζ Ursæ Minoris . .		4.3	15	48	6.701	− 2.2563	+ 78	8	29.99	− 10.915
ε Coronæ Borealis .		4.0	15	52	54.626	+ 2.4832	+ 27	12	20.08	10.620
δ Scorpii . . .		2.3	15	53	39.148	3.5383	− 22	17	57.44	10.540
$β^1$ Scorpii . . .		2.0	15	58	52.030	3.4804	− 19	29	43.49	10.150
* $δ^1$ Apodis . . .		5.3	16	3	29.282	+ 8.7477	− 78	24	29.75	− 9.742

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MEAN PLACES FOR 1887.0. (January 0d.0—0d.047, Washington.)

Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
* φ Herculis	4.0	16	5	12.390	+ 1.8812	+ 45	13	53.51	− 9.588
Groombridge 2320	6.3	16	6	0.765	0.1388	+ 68	6	28.63	9.499
δ Ophiuchi	3.0	16	8	25.444	3.1395	− 3	24	9.58	9.525
* σ Coronæ Borealis (*mean*)	5.7	16	10	26.758	2.2446	+ 34	8	43.93	9.265
* γ Apodis	4.3	16	16	8.437	9.0017	− 78	38	26.09	8.828
τ Herculis	3.3	16	16	20.685	+ 1.8009	+ 46	34	57.73	− 8.741
* η Ursæ Minoris	5.0	16	20	48.926	− 1.8192	+ 76	0	55.45	8.156
α Scorpii (*Antares*)	1.3	16	22	28.756	+ 3.6698	− 26	10	49.30	8.315
η Draconis	2.7	16	22	27.836	0.8059	+ 61	46	12.34	8.225
β Herculis	2.3	16	25	21.743	+ 2.5774	+ 21	44	11.17	8.066
A Draconis	5.0	16	28	12.581	− 0.1359	+ 69	0	44.72	− 7.798
ζ Ophiuchi	2.7	16	30	56.206	+ 3.2989	− 10	20	14.80	7.577
α Trianguli Australis	2.0	16	36	42.469	6.3015	− 68	49	6.16	7.179
η Herculis	3.3	16	39	1.303	2.0537	+ 39	8	15.34	7.030
α Camelopardalis S. P.	4.7	16	42	49.043	5.9233	+113	51	3.19	6.625
κ Ophiuchi	3.3	16	52	19.193	+ 2.8373	+ 9	33	5.06	− 5.842
d Herculis	5.0	16	57	26.051	+ 2.2112	+ 33	43	56.67	5.405
ε Ursæ Minoris	4.3	16	57	34.614	− 6.3391	+ 82	13	18.36	5.397
* η Ophiuchi	2.7	17	3	53.831	+ 3.4368	− 15	35	2.91	4.751
α¹ Herculis (*var.*)	3.5	17	9	29.705	2.7334	+ 14	31	11.20	4.357
* π Herculis	3.0	17	11	6.705	+ 2.0890	+ 36	56	12.98	− 4.237
* θ Ophiuchi	3.3	17	15	4.183	3.6789	− 24	53	9.06	3.957
b Ophiuchi (*var.*)	5.0	17	19	28.164	3.6589	− 24	4	13.34	3.659
* δ Aræ	4.0	17	20	54.090	5.3999	− 60	35	17.80	3.545
Groombr. 966 S. P.	6.3	17	24	37.555	+ 7.9989	+105	1	59.54	3.102
* Groombr. 944 S. P.	6.3	17	25	52.405	− 18.6367	+ 94	51	46.30	− 2.986
β Draconis	2.7	17	27	52.811	1.3533	+ 52	23	6.81	2.802
α Ophiuchi	2.0	17	29	41.350	2.7828	+ 12	38	34.57	2.881
* ι Herculis	3.3	17	36	16.610	1.6965	+ 46	4	0.40	2.074
ω Draconis	5.0	17	37	36.864	− 0.3541	+ 68	48	36.20	1.632
μ Herculis	3.3	17	42	2.200	+ 2.3463	+ 27	47	13.97	− 2.330
ψ¹ Draconis	4.3	17	43	56.915	− 1.0796	+ 72	12	14.24	1.676
* θ Herculis	4.0	17	52	22.644	+ 2.0551	+ 37	15	57.38	0.648
γ Draconis	2.3	17	53	58.939	1.3914	+ 51	30	8.62	0.556
γ² Sagittarii	3.3	17	58	32.932	3.8514	− 30	25	28.08	− 0.346
* ο Herculis	4.0	18	3	8.088	+ 2.3393	+ 28	44	50.73	+ 0.277
22 Camelop. (H.) S. P.	4.7	18	6	23.351	6.6176	+110	38	32.35	0.677
μ Sagittarii	4.0	18	7	0.338	+ 3.5866	− 21	5	14.77	0.600
δ Ursæ Minoris	4.3	18	8	46.030	− 19.4595	+ 86	36	39.43	0.818
η Serpentis	3.0	18	15	27.769	+ 3.1023	− 2	55	37.70	0.677
* λ Sagittarii	3.0	18	20	59.811	+ 3.7027	− 25	28	59.68	+ 1.625
* χ Draconis	4.0	18	23	5.574	− 1.0794	+ 72	41	0.55	1.641
1 Aquilæ	4.3	18	29	3.478	+ 3.2645	− 8	19	20.48	2.205
* ζ Pavonis	4.0	18	29	49.594	7.0302	− 71	31	20.82	2.461
α Lyræ (*Vega*)	1.0	18	33	6.772	2.0313	+ 38	40	43.86	3.160
σ Octantis	6.0	18	37	3.996	+ 106.7702	− 89	16	11.47	+ 3.210
β Lyræ (*var.*)	4.0	18	45	54.494	2.2142	+ 33	13	54.65	3.973
51 Cephei (H.) S. P.	5.3	18	47	15.649	29.9640	+ 92	46	42.94	4.198
σ Sagittarii	2.3	18	48	15.504	+ 3.7218	− 26	26	10.04	4.114
50 Draconis	6.0	18	50	0.780	− 1.9066	+ 75	18	0.86	+ 4.416

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MEAN PLACES FOR 1887.0. (January $0^d.0$—$0^d.047$, Washington.)

Name of Star.		Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
			h m s	s	° ′ ″	″
* γ Lyræ . . .		3.3	18 54 43.012	+ 2.2443	+ 32 32 6.18	+ 4.753
ζ Aquilæ . . .		3.0	19 0 12.994	2.7569	+ 13 41 45.99	5.105
* ι Lyræ . . .		5.0	19 3 16.202	2.1412	+ 35 55 24.52	5.475
* 25 Camelopardalis	S. P.	4.7	19 7 15.763	12.9710	+ 97 22 26.00	5.831
d Sagittarii . . .		5.0	19 11 1.389	3.5124	— 19 9 11.27	6.098
* θ Lyræ . . .		4.3	19 12 26.712	+ 2.0790	+ 37 55 58.00	+ 6.235
δ Draconis . . .		3.0	19 12 31.650	+ 0.0301	+ 67 27 45.96	6.326
τ Draconis . . .		4.7	19 17 43.370	— 1.1156	+ 73 8 43.53	6.779
Piazzi vii. 67 .	S. P.	6.0	19 19 7.091	+ 6.3007	+111 18 18.16	6.824
δ Aquilæ . . .		3.3	19 19 48.052	3.0253	+ 2 53 24.52	6.919
* β Cygni . . .		3.0	19 26 9.866	+ 2.4194	+ 27 43 22.10	+ 7.354
κ Aquilæ . . .		5.0	19 30 48.717	3.2290	— 7 16 40.50	7.740
* β Sagittæ . . .		4.3	19 35 58.429	+ 2.6955	+ 17 12 52.70	8.126
λ Ursæ Minoris . .		6.3	19 36 48.510	—64.1900	+ 88 57 36.25	8.231
γ Aquilæ . . .		3.0	19 40 53.253	+ 2.8522	+ 10 20 18.47	8.537
* δ Cygni . . .		2.7	19 41 26.621	+ 1.8761	+ 44 51 18.84	+ 8.625
α Aquilæ (*Altair*) .		1.3	19 45 16.204	2.9276	+ 8 34 13.60	9.261
* Groombr. 1374 .	S. P.	5.7	19 46 39.130	7.2905	+105 46 55.11	9.032
* ε Pavonis . . .		4.0	19 47 31.078	+ 7.0525	— 73 12 23.96	8.959
ε Draconis . . .		3.7	19 48 32.992	— 0.1781	+ 69 58 48.49	9.174
β Aquilæ . . .		4.0	19 49 45.760	+ 2.9471	+ 6 7 30.19	+ 8.750
* γ Sagittæ . . .		3.7	19 53 43.920	2.6678	+ 19 11 8.91	9.585
* c Sagittarii . . .		5.0	19 55 42.479	3.6953	— 28 1 23.46	9.719
τ Aquilæ . . .		6.0	19 58 37.231	2.9331	+ 6 57 34.46	9.930
3 Ursæ Majoris (H.)	S. P.	5.7	20 1 33.682	6.0519	+111 11 40.97	
* θ Aquilæ . . .		3.0	20 5 28.430	+ 3.0973	— 1 9 22.07	+ 10.448
* 31 Cygni . . .		4.3	20 10 4.417	1.8893	+ 46 23 55.97	10.782
α^2 Capricorni . .		3.0	20 11 47.085	+ 3.3324	— 12 53 39.85	10.906
κ Cephei (*pr.*) . .		4.3	20 12 40.723	— 1.9191	+ 77 22 14.60	11.000
α Pavonis . .		2.0	20 16 42.626	+ 4.7855	— 57 5 45.45	11.174
γ Cygni . . .		2.3	20 18 10 476	+ 2.1536	+ 39 53 43.00	+ 11.364
π Capricorni . . .		5.0	20 20 51.193	3.4399	— 18 34 53.40	11.546
ε Delphini . . .		4.0	20 27 48.890	+ 2.8672	+ 10 55 11.33	12.034
Groombridge 3241 .		6.3	20 30 29.319	— 0.2182	+ 72 8 55.68	12.222
* α Delphini . . .		3.7	20 34 23.363	+ 2.7878	+ 15 30 49.79	12.512
* β Pavonis . . .		3.0	20 34 46.027	+ 5.4769	— 66 36 28.27	+ 12.513
α Cygni . . .		1.7	20 37 34.806	2.0443	+ 44 52 36.43	12.719
* ψ Capricorni . .		4.3	20 39 24.161	3.5590	— 25 40 34.80	12.680
* ε Cygni . . .		2.7	20 41 38.356	2.4275	+ 33 32 50.03	13.333
μ Aquarii . . .		4.7	20 46 33.535	+ 3.2400	— 9 24 24.52	13.281
12 Year Cat. 1879 .		6.0	20 52 41.289	— 2.5414	+ 80 7 40.79	+ 13.690
ν Cygni . . .		4.0	20 52 57.632	+ 2.2340	+ 40 43 56.66	13.719
σ^2 Ursæ Majoris .	S. P.	5.0	21 0 26.444	5.3580	+112 24 27.43	14.262
61^1 Cygni . . .		5.0	21 1 49.913	2.6831	+ 38 11 38.55	17.524
ζ Cygni . . .		3.0	21 8 7.596	2.5495	+ 29 45 49.31	14.604
* τ Cygni . . .		4.0	21 10 16.849	+ 2.3933	+ 37 33 47.96	+ 15.257
α Cephei . . .		2.7	21 15 52 946	1.4367	+ 62 6 24.94	15.169
1 Pegasi . . .		4.3	21 16 51.616	2.7722	+ 19 19 16.99	15.235
* ζ Capricorni . .		4.0	21 20 12.836	3.4331	— 22 54 0.78	15.393
1 Draconis (H.) .	S. P.	4.3	21 20 57.747	+ 9.0138	+ 98 10 31.74	+ 15.431

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1887.0. (January 0^d.0—0^d.047, Washington.)

	Name of Star.		Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
				h	m	s	s	°	′	″	″
	d Ursæ Majoris	S. P.	4.7	21	24	28.516	+ 5.4049	+109	40	26.01	+ 15.550
	β Aquarii		3.0	21	25	36.614	3.1619	− 6	4	4.41	15.656
	β Cephei (*pr.*)		3.0	21	27	11.922	0.7949	+ 70	3	52.81	15.755
	ξ Aquarii		5.0	21	31	44.198	3.1981	− 8	21	37.99	15.966
*	74 Cygni		5.0	21	32	25.207	2.4013	+ 39	54	21.49	16.047
*	λ^1 Octantis		5.3	21	33	28.879	+ 9.8150	− 83	14	14.22	+ 16.013
*	ζ Chamælontis	S. P.	5.0	21	37	11.056	− 1.5553	− 99	33	59.89	16.290
	ε Pegasi		2.3	21	38	38.185	+ 2.9467	+ 9	21	26.20	16.351
	11 Cephei		5.0	21	40	15.928	0.9021	+ 70	47	28.44	16.537
*	π^2 Cygni		4.3	21	42	37.141	2.2130	+ 48	47	13.12	16.539
	μ Capricorni		5.0	21	47	8.100	+ 3.2763	− 14	4	59.91	+ 16.774
*	16 Pegasi		5.3	21	47	55.237	2.7277	+ 25	23	37.47	16.814
	79 Draconis		6.3	21	51	27.448	0.7304	+ 73	10	4.02	17.012
	α Aquarii		3.0	21	59	58.799	3.0828	− 0	52	6.61	17.352
	α Gruis		2.0	22	1	6.471	3.8072	− 47	30	27.45	17.242
*	π Pegasi		4.0	22	4	58.155	+ 2.6598	+ 32	37	26.61	+ 17.577
*	υ Octantis		6.0	22	9	45.304	13.2622	− 86	32	25.78	17.863
	32 Ursæ Majoris	S. P.	6.0	22	9	49.181	4.4236	+114	19	42.86	17.806
	θ Aquarii		4.3	22	10	52.243	3.1693	− 8	20	44.37	17.798
*	γ Aquarii		3.3	22	15	49.159	3.1215	− 1	57	23.46	18.035
	π Aquarii		4.7	22	19	30.383	+ 3.0648	+ 0	48	15.32	+ 18.151
*	σ Aquarii		5.0	22	24	39.925	3.1760	− 11	15	21.25	18.315
	9 Draconis (H.)	S. P.	4.7	22	25	28.469	5.2696	+103	42	19.71	18.387
*	α Lacertæ		4.0	22	26	38.187	2.4618	+ 49	42	5.95	18.412
	η Aquarii		4.0	22	29	32.981	3.0837	− 0	41	58.87	18.454
	226 Cephei (B.)		5.3	22	30	17.303	+ 1.0783	+ 75	38	38.78	+ 18.527
*	10 Lacertæ		5.0	22	34	11.476	2.6862	+ 38	27	44.24	18.666
*	β Octantis		4.7	22	34	27.011	6.5005	− 81	58	23.37	18.674
	ζ Pegasi		3.3	22	35	49.594	2.9909	+ 10	14	30.10	18.703
*	λ Pegasi		4.0	22	41	5.303	2.8850	+ 22	58	16.19	18.871
	ι Cephei		3.3	22	45	39.436	+ 2.1213	+ 65	36	22.02	+ 18.875
	λ Aquarii		4.0	22	46	43.172	3.1329	− 8	10	50.32	19.072
*	Groombr. 1706	S. P.	6.0	22	50	53.421	4.9776	+101	37	29.00	19.176
	α Pis. Aus. (*Fomalhaut*)		1.3	22	51	24.307	3.3254	− 30	13	15.29	18.991
	α Ursæ Majoris	S. P.	2.0	22	56	44.895	3.7494	+117	38	20.92	19.361
*	ο Andromedæ		3.7	22	56	43.348	+ 2.7494	+ 41	43	7.14	+ 19.285
	α Pegasi (*Markab*)		2.0	22	59	7.940	2.9848	+ 14	35	50.52	19.300
*	φ Aquarii		4.3	23	8	28.232	3.1089	− 6	39	28.72	19.356
	υ Cephei		5.3	23	13	59.336	2.4430	+ 67	29	36.22	19.668
*	τ Pegasi		4.7	23	15	2.653	2.9633	+ 23	7	18.40	19.654
	θ Piscium		4.7	23	22	14.158	+ 3.0411	+ 5	45	29.68	+ 19.726
	λ Draconis	S. P.	3.3	23	24	41.130	3.6241	+110	2	43.35	19.836
*	λ Andromedæ		4.0	23	32	2.100	2.9215	+ 45	50	44.58	19.471
	ι Piscium		4.3	23	34	8.302	3.0840	+ 5	0	49.94	19.483
	γ Cephei		3.3	23	34	42.721	2.4136	+ 77	0	5.75	20.075
*	i^1 Aquarii		5.0	23	38	20.448	+ 3.1172	− 18	54	14.33	+ 19.958
*	δ Sculptoris		4.3	23	43	2.380	3.1329	− 28	45	17.49	19.856
*	γ^1 Octantis		5.3	23	45	26.283	3.6979	− 82	38	48.56	19.992
	Groombridge 4163		7.0	23	49	20.617	2.8629	+ 73	46	53.30	20.022
	ω Piscium		4.0	23	53	30.536	3.0783	+ 6	14	15.63	19.931
*	33 Piscium		5.0	23	59	33.099	+ 3.0709	− 6	20	22.76	+ 20.144

***Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.**

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	*δ* Ursæ Minoris.		Mean Solar Date.	*λ* Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	1 17	+88 42	Jan.	6 47	+87 13	Jan.	18 8	+86 36	Jan.	19 35	+88 57
	s	″		s	″		s	″		s	″
0.3	52.45	35.9	0.5	36.42	8.6	1.0	26.76	44.9	1.1	58.80	47.6
1.3	51.47	35.9	1.5	36.45	8.9	2.0	26.80	44.6	2.0	58.45	47.3
2.3	50.56	36.0	2.5	36.49	9.2	3.0	26.85	44.3	3.0	58.13	47.0
3.3	49.68	36.1	3.5	36.53	9.5	4.0	26.88	43.9	4.0	57.80	46.7
4.3	48.83	36.1	4.5	36.60	9.8	5.0	26.90	43.6	5.0	57.43	46.4
5.3	47.99	36.2	5.5	36.67	10.1	6.0	26.91	43.3	6.0	57.03	46.1
6.3	47.14	36.3	6.5	36.76	10.4	7.0	26.91	43.0	7.0	56.59	45.9
7.3	46.26	36.4	7.5	36.86	10.7	8.0	26.92	42.7	8.0	56.13	45.5
8.3	45.33	36.5	8.5	36.95	11.0	8.9	26.95	42.3	9.0	55.67	45.2
9.2	44.33	36.6	9.5	37.04	11.4	9.9	26.99	41.9	10.0	55.25	44.9
10.2	43.28	36.7	10.5	37.10	11.7	10.9	27.05	41.6	11.0	54.90	44.5
11.2	42.19	36.7	11.5	37.12	12.1	11.9	27.13	41.2	12.0	54.63	44.1
12.2	41.12	36.8	12.5	37.12	12.4	12.9	27.23	40.8	13.0	54.42	43.8
13.2	40.02	36.8	13.5	37.09	12.8	13.9	27.35	40.5	14.0	54.30	43.4
14.2	38.98	36.8	14.5	37.02	13.1	14.9	27.47	40.1	15.0	54.24	43.1
15.2	38.00	36.8	15.5	36.96	13.4	15.9	27.60	39.8	16.0	54.22	42.8
16.2	37.05	36.8	16.4	36.87	13.7	16.9	27.72	39.6	17.0	54.19	42.5
17.2	36.20	36.8	17.4	36.81	14.0	17.9	27.84	39.3	18.0	54.16	42.1
18.2	35.31	36.7	18.4	36.76	14.3	18.9	27.95	39.0	19.0	54.09	41.9
19.2	34.46	36.7	19.4	36.73	14.6	19.9	28.05	38.7	20.0	53.98	41.6
20.2	33.59	36.7	20.4	36.70	14.9	20.9	28.16	38.4	21.0	53.86	41.3
21.2	32.67	36.8	21.4	36.67	15.2	21.9	28.28	38.1	22.0	53.73	40.9
22.2	31.71	36.8	22.4	36.64	15.5	22.9	28.40	37.7	23.0	53.63	40.6
23.2	30.70	36.8	23.4	36.58	15.9	23.9	28.54	37.4	24.0	53.59	40.2
24.2	29.63	36.7	24.4	36.49	16.2	24.9	28.71	37.0	25.0	53.62	39.8
25.2	28.55	36.7	25.4	36.37	16.6	25.9	28.90	36.7	26.0	53.73	39.5
26.2	27.47	36.6	26.4	36.22	16.9	26.9	29.11	36.4	27.0	53.94	39.1
27.2	26.43	36.5	27.4	36.03	17.2	27.9	29.34	36.1	28.0	54.20	38.7
28.2	25.40	36.4	28.4	35.83	17.6	28.9	29.75	35.8	29.0	54.52	38.4
29.2	24.44	36.3	29.4	35.61	17.9	29.9	29.80	35.5	30.0	54.86	38.1
30.2	23.55	36.2	30.4	35.40	18.1	30.9	30.03	35.3	31.0	55.19	37.8
31.2	22.70	36.1	31.4	35.20	18.4	31.9	30.25	35.0	32.0	55.50	37.5
32.2	21.89	36.0	32.4	35.02	18.7	32.9	30.44	34.8			

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	1 16	+88 42	Feb.	6 47	+87 13	Feb.	18 8	+86 36	Feb.	19 35	+88 57
	s	″		s	″		s	″		s	″
1.2	81.89	36.0	1.4	35.02	18.7	1.9	30.44	34.8	1.0	55.50	37.5
2.2	81.06	35.9	2.4	34.87	18.9	2.9	30.64	34.5	2.0	55.75	37.2
3.2	80.25	35.8	3.4	34.72	19.2	3.9	30.84	34.3	3.0	55.99	36.9
4.2	79.38	35.7	4.4	34.58	19.5	4.9	31.03	34.0	4.0	56.19	36.6
5.2	78.47	35.7	5.4	34.42	19.8	5.9	31.24	33.7	5.0	56.38	36.3
6.2	77.52	35.6	6.4	34.25	20.1	6.9	31.47	33.4	6.0	56.61	36.0
7.2	76.52	35.5	7.4	34.05	20.4	7.9	31.71	33.1	6.9	56.89	35.7
8.2	75.52	35.3	8.4	33.83	20.7	8.9	31.98	32.8	7.9	57.24	35.3
9.2	74.54	35.2	9.4	33.57	21.0	9.9	32.26	32.6	8.9	57.66	35.0
10.2	73.60	35.0	10.4	33.29	21.3	10.9	32.56	32.3	9.9	58.16	34.6
11.2	72.72	34.8	11.4	32.99	21.6	11.9	32.86	32.1	10.9	58.71	34.3
12.2	71.89	34.6	12.4	32.69	21.8	12.9	33.15	31.9	11.9	59.33	34.0
13.2	71.12	34.4	13.4	32.38	22.1	13.9	33.43	31.7	12.9	59.95	33.7
14.2	70.40	34.3	14.4	32.10	22.3	14.9	33.71	31.5	13.9	60.56	33.4
15.1	69.71	34.1	15.4	31.83	22.5	15.9	33.98	31.3	14.9	61.13	33.2
16.1	69.02	33.9	16.4	31.58	22.7	16.9	34.23	31.1	15.9	61.67	32.9
17.1	68.30	33.8	17.4	31.33	22.9	17.8	34.50	30.9	16.9	62.19	32.7
18.1	67.56	33.6	18.4	31.08	23.1	18.8	34.77	30.7	17.9	62.69	32.4
19.1	66.75	33.4	19.4	30.82	23.4	19.8	35.06	30.5	18.9	63.19	32.1
20.1	65.92	33.3	20.4	30.54	23.6	20.8	35.36	30.3	19.9	63.74	31.8
21.1	65.05	33.1	21.4	30.22	23.9	21.8	35.68	30.1	20.9	64.35	31.5
22.1	64.20	32.9	22.4	29.87	24.2	22.8	36.04	29.8	21.9	65.03	31.2
23.1	63.36	32.6	23.4	29.49	24.4	23.8	36.40	29.7	22.9	65.78	30.9
24.1	62.58	32.4	24.3	29.09	24.6	24.8	36.76	29.5	23.9	66.60	30.6
25.1	61.83	32.1	25.3	28.68	24.8	25.8	37.13	29.3	24.9	67.51	30.3
26.1	61.20	31.8	26.3	28.28	25.0	26.8	37.49	29.2	25.9	68.44	30.1
27.1	60.59	31.5	27.3	27.88	25.2	27.8	37.84	29.1	26.9	69.34	29.9
28.1	60.05	31.3	28.3	27.51	25.3	28.8	38.17	29.0	27.9	70.23	29.7
29.1	59.52	31.1	29.3	27.15	25.5	29.8	38.49	28.9	28.9	71.07	29.5
									29.9	71.87	29.3

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Mar.	h m 1 16	+88° 42′	Mar.	h m 6 47	+87° 13′	Mar.	h m 18 8	+86° 36′	Mar.	h m 19 36	+88° 57′
	s	″		s	″		s	″		s	″
1.1	59.52	31.1	1.3	27.15	25.5	1.8	38.49	28.9	1.9	11.87	29.3
2.1	58.99	30.8	2.3	26.82	25.6	2.8	38.80	28.6	2.9	12.63	29.0
3.1	58.45	30.6	3.3	26.49	25.8	3.8	39.11	28.7	3.9	13.38	28.8
4.1	57.87	30.4	4.3	26.17	26.0	4.8	39.43	28.5	4.9	14.11	28.6
5.1	57.24	30.2	5.3	25.84	26.1	5.8	39.76	28.4	5.9	14.89	28.4
6.1	56.61	29.9	6.3	25.49	26.3	6.8	40.11	28.2	6.9	15.72	28.1
7.1	55.94	29.7	7.3	25.11	26.5	7.8	40.47	28.1	7.9	16.62	27.9
8.1	55.30	29.4	8.3	24.70	26.7	8.8	40.84	28.0	8.9	17.59	27.6
9.1	54.67	29.1	9.3	24.27	26.8	9.8	41.22	27.9	9.9	18.63	27.4
10.1	54.12	28.8	10.3	23.82	27.0	10.8	41.62	27.8	10.9	19.71	27.2
11.1	53.64	28.5	11.3	23.37	27.1	11.8	42.00	27.7	11.9	20.83	27.0
12.1	53.22	28.2	12.3	22.92	27.2	12.8	42.37	27.7	12.9	21.93	26.9
13.1	52.87	27.9	13.3	22.49	27.3	13.8	42.73	27.7	13.9	22.99	26.8
14.1	52.56	27.6	14.3	22.09	27.4	14.8	43.08	27.7	14.9	24.01	26.6
15.1	52.26	27.3	15.3	21.71	27.4	15.8	43.41	27.7	15.8	24.97	26.5
16.1	51.98	27.1	16.3	21.34	27.5	16.8	43.74	27.6	16.8	25.88	26.4
17.1	51.63	26.8	17.3	20.97	27.6	17.8	44.08	27.6	17.8	26.78	26.2
18.1	51.26	26.5	18.3	20.60	27.7	18.8	44.42	27.5	18.8	27.71	26.1
19.1	50.85	26.3	19.3	20.21	27.8	19.8	44.77	27.5	19.8	28.66	25.9
20.1	50.42	26.0	20.3	19.81	27.9	20.8	45.13	27.4	20.8	29.69	25.7
21.1	49.99	25.7	21.3	19.38	28.0	21.8	45.52	27.4	21.8	30.80	25.6
22.0	49.56	25.4	22.3	18.92	28.1	22.8	45.92	27.3	22.8	31.98	25.4
23.0	49.19	25.0	23.3	18.43	28.2	23.8	46.33	27.3	23 8	33.19	25.3
24.0	48.87	24.7	24.3	17.94	28.2	24.7	46.74	27.4	24.8	34.45	25.1
25.0	48.63	24.3	25.3	17.44	28.2	25.7	47.14	27.4	25.8	35.71	25.0
26.0	48.47	24.0	26.3	16.95	28.2	26.7	47.52	27.5	26.8	36.93	25.0
27.0	48.35	23.7	27.3	16.50	28.2	27.7	47.89	27.5	27.8	38.09	24.9
28.0	48.29	23.3	28.3	16.07	28.2	28.7	48.24	27.6	28.8	39.20	24.9
29.0	48.21	23.0	29.3	15.66	28.2	29.7	48.57	27.7	29.8	40.27	24.8
30.0	48.15	22.7	30.3	15.28	28.2	30.7	48.89	27.7	30.8	41.29	24.8
31.0	48.06	22.5	31.3	14.90	28.2	31.7	49.21	27.8	31.8	42.30	24.7
32.0	47.93	22.2	32.3	14.51	28.2	32.7	49.54	27.8	32.8	43.31	24.6

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Apr.	h m 1 16	° ′ +88 42	Apr.	h m 6 47	° ′ +87 13	Apr.	h m 18 8	° ′ +86 36	Apr.	h m 19 36	° ′ +88 57
	s	″		s	″		s	″		s	″
1.0	47.93	22.2	1.3	14.51	28.2	1.7	49.54	27.8	1.8	43.31	24.6
2.0	47.76	21.9	2.2	14.12	28.3	2.7	49.88	27.8	2.8	44.36	24.5
3.0	47.58	21.6	3.2	13.71	28.3	3.7	50.23	27.8	3.8	45.46	24.4
4.0	47.41	21.3	4.2	13.28	28.3	4.7	50.60	27.9	4.8	46.61	24.4
5.0	47.26	21.0	5.2	12.84	28.3	5.7	50.97	27.9	5.8	47.83	24.3
6.0	47.17	20.7	6.2	12.37	28.3	6.7	51.35	28.0	6.8	49.08	24.2
7.0	47.15	20.3	7.2	11.89	28.3	7.7	51.73	28.1	7.8	50.35	24.2
8.0	47.19	20.0	8.2	11.43	28.2	8.7	52.09	28.3	8.8	51.61	24.2
9.0	47.31	19.6	9.2	10.98	28.1	9.7	52.43	28.4	9.8	52.84	24.2
10.0	47.47	19.3	10.2	10.55	28.0	10.7	52.75	28.6	10.8	54.01	24.3
11.0	47.67	19.0	11.2	10.15	27.9	11.7	53.06	28.7	11.8	55.12	24.3
12.0	47.85	18.7	12.2	9.78	27.8	12.7	53.36	28.9	12.8	56.18	24.3
13.0	48.03	18.4	13.2	9.42	27.7	13.7	53.66	29.0	13.8	57.20	24.4
14.0	48.17	18.1	14.2	9.07	27.7	14.7	53.96	29.1	14.8	58.22	24.4
15.0	48.27	17.9	15.2	8.70	27.6	15.7	54.26	29.2	15.8	59.26	24.4
16.0	48.34	17.6	16.2	8.32	27.5	16.7	54.56	29.3	16.8	60.34	24.3
17.0	48.39	17.3	17.2	7.92	27.5	17.7	54.89	29.4	17.8	61.49	24.4
18.0	48.45	17.0	18.2	7.50	27.4	18.7	55.24	29.6	18.8	62.69	24.4
19.0	48.55	16.6	19.2	7.05	27.4	19.7	55.59	29.7	19.8	63.93	24.4
20.0	48.71	16.3	20.2	6.59	27.3	20.7	55.93	29.9	20.8	65.21	24.4
21.0	48.93	16.0	21.2	6.14	27.1	21.7	56.27	30.1	21.7	66.49	24.5
22.0	49.23	15.6	22.2	5.70	27.0	22.7	56.58	30.3	22.7	67.73	24.6
23.0	49.58	15.3	23.2	5.28	26.8	23.7	56.89	30.5	23.7	68.92	24.7
24.0	49.99	15.0	24.2	4.89	26.7	24.7	57.17	30.7	24.7	70.04	24.8
25.0	50.41	14.7	25.2	4.53	26.5	25.7	57.43	30.9	25.7	71.09	24.9
26.0	50.84	14.5	26.2	4.21	26.3	26.7	57.68	31.2	26.7	72.08	25.0
26.9	51.24	14.2	27.2	3.90	26.2	27.7	57.91	31.3	27.7	73.03	25.1
27.9	51.60	14.0	28.2	3.59	26.0	28.7	58.15	31.5	28.7	73.98	25.2
28.9	51.92	13.7	29.2	3.29	25.9	29.6	58.39	31.7	29.7	74.94	25.3
29.9	52.23	13.5	30.2	2.97	25.8	30.6	58.65	31.9	30.7	75.94	25.4
30.9	52.52	13.2	31.2	2.63	25.6	31.6	58.92	32.1	31.7	76.97	25.5
31.9	52.83	12.9									

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date	*a* Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
May	h m 1 16	° ′ +88 42	May	h m 6 46	° ′ +87 13	May	h m 18 8	° ′ +86 36	May	h m 19 37	° ′ +88 57
	s	″		s	″		s	″		s	″
1.9	52.83	12.9	1.2	62.63	25.6	1.6	58.92	32.1	1.7	16.97	25.5
2.9	53.18	12.7	2.2	62.28	25.5	2.6	59.19	32.3	2.7	18.05	25.5
3.9	53.59	12.4	3.2	61.92	25.4	3.6	59.47	32.5	3.7	19.18	25.7
4.9	54.07	12.1	4.2	61.54	25.2	4.6	59.74	32.7	4.7	20.32	25.8
5.9	54.61	11.8	5.2	61.18	25.0	5.6	60.00	33.0	5.7	21.44	25.9
6.9	55.22	11.5	6.1	60.83	24.8	6.6	60.24	33.2	6.7	22.54	26.1
7.9	55.85	11.3	7.1	60.51	24.5	7.6	60.47	33.5	7.7	23.56	26.3
8.9	56.50	11.0	8.1	60.21	24.3	8.6	60.67	33.8	8.7	24.52	26.5
9.9	57.14	10.8	9.1	59.94	24.0	9.6	60.85	34.1	9.7	25.41	26.7
10.9	57.73	10.6	10.1	59.69	23.8	10.6	61.03	34.4	10.7	26.25	26.9
11.9	58.28	10.4	11.1	59.46	23.6	11.6	61.21	34.6	11.7	27.07	27.0
12.9	58.81	10.2	12.1	59.24	23.4	12.6	61.38	34.8	12.7	27.88	27.2
13.9	59.28	10.0	13.1	58.99	23.2	13.6	61.56	35.0	13.7	28.72	27.3
14.9	59.76	9.7	14.1	58.72	23.0	14.6	61.76	35.3	14.7	29.61	27.5
15.9	60.25	9.5	15.1	58.44	22.8	15.6	61.97	35.5	15.7	30.54	27.6
16.9	60.80	9.2	16.1	58.15	22.6	16.6	62.18	35.8	16.7	31.52	27.8
17.9	61.40	9.0	17.1	57.84	22.4	17.6	62.40	36.0	17.7	32.51	28.0
18.9	62.08	8.7	18.1	57.52	22.2	18.6	62.60	36.3	18.7	33.51	28.2
19.9	62.82	8.5	19.1	57.23	21.9	19.6	62.79	36.6	19.7	34.49	28.4
20.9	63.60	8.3	20.1	56.95	21.7	20.6	62.96	37.0	20.7	35.41	28.6
21.9	64.40	8.1	21.1	56.70	21.4	21.6	63.10	37.3	21.7	36.25	28.9
22.9	65.20	7.9	22.1	56.49	21.1	22.6	63.22	37.6	22.7	37.01	29.1
23.9	66.00	7.7	23.1	56.31	20.8	23.6	63.33	37.9	23.7	37.72	29.4
24.9	66.75	7.6	24.1	56.15	20.5	24.6	63.43	38.2	24.7	38.36	29.6
25.9	67.46	7.5	25.1	56.00	20.3	25.6	63.52	38.5	25.7	38.97	29.8
26.9	68.12	7.3	26.1	55.86	20.0	26.6	63.61	38.7	26.7	39.56	30.1
27.9	68.77	7.2	27.1	55.73	19.8	27.6	63.70	39.0	27.6	40.19	30.3
28.9	69.42	7.0	28.1	55.57	19.6	28.6	63.81	39.3	28.6	40.86	30.5
29.9	70.09	6.9	29.1	55.39	19.3	29.6	63.92	39.5	29.6	41.56	30.7
30.9	70.81	6.7	30.1	55.19	19.1	30.6	64.04	39.8	30.6	42.30	30.9
31.9	71.60	6.5	31.1	55.00	18.8	31.6	64.16	40.1	31.6	43.05	31.2
32.9	72.44	6.3	32.1	54.81	18.5	32.6	64.26	40.5	32.6	43.79	31.4

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
June	h m 1 17	° ′ +88 42	June	h m 6 46	° ′ +87 13	June	h m 18 9	° ′ +86 36	June	h m 19 37	° ′ +88 57
	s	″		s	″		s	″		s	″
1.9	12.44	6.3	1.1	54.81	18.5	1.6	4.26	40.5	1.6	43.79	31.4
2.8	13.34	6.2	2.1	54.64	18.2	2.6	4.35	40.8	2.6	44.50	31.7
3.8	14.27	6.0	3.1	54.49	17.9	3.6	4.42	41.1	3.6	45.16	32.0
4.8	15.22	5.9	4.1	54.37	17.6	4.6	4.47	41.5	4.6	45.73	32.3
5.8	16.16	5.8	5.1	54.28	17.3	5.5	4.49	41.8	5.6	46.23	32.6
6.8	17.06	5.7	6.1	54.22	17.0	6.5	4.49	42.2	6.6	46.67	32.9
7.8	17.92	5.6	7.1	54.17	16.7	7.5	4.50	42.5	7.6	47.07	33.2
8.8	18.74	5.6	8.1	54.14	16.4	8.5	4.51	42.8	8.6	47.45	33.5
9.8	19.50	5.5	9.1	54.09	16.1	9.5	4.52	43.0	9.6	47.85	33.7
10.8	20.26	5.4	10.1	54.04	15.8	10.5	4.54	43.3	10.6	48.26	34.0
11.8	21.00	5.3	11.1	53.96	15.6	11.5	4.57	43.6	11.6	48.72	34.2
12.8	21.80	5.2	12.1	53.87	15.3	12.5	4.62	43.9	12.6	49.22	34.5
13.8	22.61	5.1	13.0	53.76	15.1	13.5	4.67	44.2	13.6	49.77	34.7
14.8	23.50	5.0	14.0	53.65	14.8	14.5	4.70	44.5	14.6	50.31	35.0
15.8	24.44	4.9	15.0	53.55	14.5	15.5	4.73	44.8	15.6	50.83	35.3
16.8	25.44	4.8	16.0	53.47	14.1	16.5	4.73	45.2	16.6	51.29	35.6
17.8	26.47	4.7	17.0	53.42	13.8	17.5	4.72	45.6	17.6	51.69	36.0
18.8	27.49	4.7	18.0	53.40	13.4	18.5	4.67	45.9	18.6	52.00	36.3
19.6	28.50	4.6	19.0	53.41	13.1	19.5	4.60	46.2	19.6	52.25	36.7
20.8	29.47	4.6	20.0	53.46	12.8	20.5	4.53	46.6	20.6	52.42	37.0
21.8	30.39	4.6	21.0	53.52	12.5	21.5	4.45	46.9	21.6	52.53	37.3
22.8	31.26	4.6	22.0	53.58	12.2	22.5	4.37	47.2	22.6	52.63	37.6
23.8	32.08	4.7	23.0	53.65	11.9	23.5	4.29	47.5	23.6	52.74	37.9
24.8	32.90	4.6	24.0	53.71	11.6	24.5	4.21	47.7	24.6	52.88	38.2
25.8	33.73	4.6	25.0	53.75	11.4	25.5	4.15	48.0	25.6	53.05	38.4
26.8	34.59	4.6	26.0	53.77	11.1	26.5	4.09	48.3	26.6	53.25	38.7
27.8	35.51	4.6	27.0	53.78	10.8	27.5	4.04	48.6	27.6	53.49	39.0
28.8	36.48	4.5	28.0	53.80	10.5	28.5	3.97	48.9	28.6	53.72	39.3
29.8	37.49	4.5	29.0	53.83	10.2	29.5	3.89	49.2	29.6	53.93	39.7
30.8	38.54	4.5	30.0	53.88	9.8	20.5	3.78	49.6	30.6	54.09	40.0
31.8	39.61	4.5	31.0	53.96	9.5	31.5	3.66	49.9	31.6	54.16	40.4

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	1 17	+88 42	July	6 46	+87 13	July	18 8	+86 36	July	19 37	+88 57
	s	″		s	″		s	″		s	″
1.8	39.61	4.5	1.0	53.96	9.5	1.5	63.66	49.9	1.6	54.16	40.4
2.8	40.68	4.6	2.0	54.06	9.1	2.5	63.52	50.3	2.5	54.17	40.8
3.8	41.71	4.6	3.0	54.20	8.8	3.5	63.36	50.6	3.5	54.10	41.1
4.8	42.70	4.7	4.0	54.37	8.5	4.5	63.19	50.9	4.5	53.98	41.4
5.8	43.63	4.8	5.0	54.54	8.2	5.5	63.02	51.2	5.5	53.82	41.8
6.8	44.50	4.9	6.0	54.72	7.9	6.5	62.86	51.5	6.5	53.66	42.1
7.8	45.33	4.9	7.0	54.87	7.6	7.5	62.71	51.7	7.5	53.53	42.4
8.7	46.16	5.0	8.0	55.02	7.4	8.5	62.56	52.0	8.5	53.45	42.7
9.7	46.99	5.0	9.0	55.15	7.1	9.5	62.43	52.3	9.5	53.39	43.0
10.7	47.87	5.0	10.0	55.26	6.8	10.5	62.31	52.5	10.5	53.38	43.2
11.7	48.78	5.1	11.0	55.37	6.5	11.4	62.17	52.8	11.5	53.36	43.5
12.7	49.76	5.1	12.0	55.47	6.2	12.4	62.02	53.1	12.5	53.35	43.9
13.7	50.78	5.2	13.0	55.59	5.9	13.4	61.86	53.5	13.5	53.29	44.2
14.7	51.82	5.2	14.0	55.72	5.6	14.4	61.69	53.8	14.5	53.18	44.6
15.7	52.88	5.3	15.0	55.90	5.2	15.4	61.49	54.1	15.5	52.97	44.9
16.7	53.92	5.5	16.0	56.11	4.9	16.4	61.27	54.4	16.5	52.68	45.3
17.7	54.92	5.6	17.0	56.35	4.6	17.4	61.04	54.7	17.5	52.33	45.6
18.7	55.87	5.8	18.0	56.61	4.3	18.4	60.79	55.0	18.5	51.92	46.0
19.7	56.76	5.9	19.0	56.88	4.0	19.4	60.54	55.2	19.5	51.48	46.3
20.7	57.61	6.1	19.9	57.16	3.7	20.4	60.29	55.5	20.5	51.03	46.6
21.7	58.42	6.2	20.9	57.42	3.5	21.4	60.04	55.7	21.5	50.61	46.9
22.7	59.23	6.3	21.9	57.66	3.2	22.4	59.81	55.9	22.5	50.22	47.2
23.7	60.04	6.5	22.9	57.90	3.0	23.4	59.59	56.2	23.5	49.87	47.5
24.7	60.91	6.6	23.9	58.12	2.7	24.4	59.38	56.4	24.5	49.55	47.8
25.7	61.83	6.8	24.9	58.33	2.5	25.4	59.16	56.7	25.5	49.24	48.1
26.7	62.79	6.9	25.9	58.55	2.2	26.4	58.93	56.9	26.5	48.90	48.4
27.7	63.79	6.9	26.9	58.78	1.9	27.4	58.69	57.2	27.5	48.54	48.8
28.7	64.79	7.1	27.9	59.05	1.6	28.4	58.42	57.5	28.5	48.12	49.1
29.7	65.82	7.3	28.9	59.34	1.2	29.4	58.13	57.8	29.5	47.61	49.5
30.7	66.81	7.5	29.9	59.66	0.9	30.4	57.83	58.1	30.5	47.02	49.8
31.7	67.73	7.7	30.9	60.00	0.6	31.4	57.52	58.3	31.5	46.38	50.2
32.7	68.62	7.9	31.9	60.36	0.4	32.4	57.20	58.5	32.5	45.70	50.5
			32.9	60.71	0.1						

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Aug.	1 18	+88 42	Aug.	6 47	+87 12	Aug.	18 8	+86 36	Aug.	19 37	+88 57
	s	″		s	″		s	″		s	″
1.7	8.62	7.9	1.9	0.71	60.1	1.4	57.20	58.5	1.5	45.70	50.5
2.7	9.44	8.1	2.9	1.06	59.9	2.4	56.88	58.8	2.5	45.00	50.8
3.7	10.19	8.3	3.9	1.40	59.7	3.4	56.57	58.9	3.5	44.32	51.1
4.7	10.92	8.5	4.9	1.71	59.5	4.4	56.27	59.1	4.5	43.67	51.3
5.7	11.65	8.7	5.9	2.01	59.2	5.4	55.99	59.3	5.5	43.08	51.6
6.7	12.41	8.9	6.9	2.29	59.0	6.4	55.72	59.5	6.5	42.51	51.8
7.7	13.20	9.1	7.9	2.58	58.8	7.4	55.45	59.7	7.5	41.98	52.1
8.7	14.04	9.2	8.9	2.87	58.5	8.4	55.17	59.9	8.4	41.46	52.4
9.7	14.93	9.4	9.9	3.17	58.3	9.4	54.88	60.2	9.4	40.91	52.7
10.7	15.84	9.6	10.9	3.51	58.0	10.4	54.58	60.4	10.4	40.29	53.0
11.7	16.77	9.8	11.9	3.87	57.7	11.4	54.26	60.7	11.4	39.62	53.4
12.7	17.68	10.1	12.9	4.27	57.4	12.4	53.91	60.9	12.4	38.85	53.7
13.7	18.57	10.3	13.9	4.69	57.2	13.4	53.55	61.1	13.4	38.02	54.0
14.6	19.40	10.6	14.9	5.13	57.0	14.4	53.18	61.3	14.4	37.13	54.3
15.6	20.16	10.9	15.9	5.57	56.8	15.4	52.81	61.5	15.4	36.20	54.6
16.6	20.87	11.2	16.9	6.01	56.6	16.4	52.43	61.6	16.4	35.25	54.9
17.6	21.54	11.4	17.9	6.42	56.4	17.3	52.06	61.8	17.4	34.32	55.1
18.6	22.19	11.7	18.9	6.82	56.2	18.3	51.71	61.9	18.4	33.43	55.4
19.6	22.83	12.0	19.9	7.20	56.0	19.3	51.36	62.0	19.4	32.56	55.6
20.6	23.49	12.2	20.9	7.56	55.8	20.3	51.03	62.2	20.4	31.74	55.9
21.6	24.20	12.4	21.9	7.93	55.6	21.3	50.70	62.3	21.4	30.95	56.1
22.6	24.97	12.7	22.8	8.30	55.4	22.3	50.36	62.5	22.4	30.15	56.4
23.6	25.77	12.9	23.8	8.70	55.2	23.3	50.01	62.7	23.4	29.33	56.7
24.6	26.58	13.2	24.8	9.12	54.9	24.3	49.63	62.9	24.4	28.46	57.0
25.6	27.40	13.5	25.8	9.57	54.7	25.3	49.25	63.1	25.4	27.51	57.3
26.6	28.20	13.8	26.8	10.05	54.5	26.3	48.85	63.2	26.4	26.50	57.6
27.6	28.96	14.1	27.8	10.54	54.3	27.3	48.43	63.4	27.4	25.41	57.9
28.6	29.64	14.4	28.8	11.05	54.1	28.3	48.01	63.5	28.4	24.28	58.1
29.6	30.25	14.7	29.8	11.55	54.0	29.3	47.60	63.6	29.4	23.13	58.4
30.6	30.82	15.1	30.8	12.03	53.8	30.3	47.19	63.7	30.4	22.01	58.6
31.6	31.33	15.4	31.8	12.49	53.7	31.3	46.79	63.8	31.4	20.91	58.8
32.6	31.83	15.7	32.8	12.93	53.6	32.3	46.41	63.9	32.4	19.86	59.0

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	*δ* Ursæ Minoris.		Mean Solar Date.	*λ* Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Sept.	h m 1 18	° ′ +88 42	Sept.	h m 6 47	° ′ +87 12	Sept.	h m 18 8	° ′ +86 37	Sept.	h m 19 36	° ′ +88 57
	s	″		s	″		s	″		s	″
1.6	31.83	15.7	1.8	12.93	53.6	1.3	46.41	3.9	1.4	79.86	59.0
2.6	32.33	16.0	2.8	13.35	53.5	2.3	46.05	3.9	2.4	78.87	59.2
3.6	32.86	16.2	3.8	13.76	53.3	3.3	45.69	4.0	3.4	77.90	59.4
4.6	33.44	16.5	4.8	14.17	53.1	4.3	45.32	4.1	4.4	76.95	59.6
5.6	34.05	16.8	5.8	14.59	53.0	5.3	44.95	4.2	5.4	76.00	59.8
6.6	34.71	17.1	6.8	15.03	52.8	6.3	44.57	4.4	6.4	75.01	60.1
7.6	35.37	17.4	7.8	15.50	52.6	7.3	44.18	4.5	7.4	73.95	60.3
8.6	36.03	17.8	8.8	16.01	52.5	8.3	43.76	4.6	8.4	72.83	60.6
9.6	36.66	18.2	9.8	16.54	52.3	9.3	43.32	4.7	9.4	71.62	60.8
10.6	37.25	18.5	10.8	17.08	52.2	10.3	42.88	4.8	10.4	70.36	61.0
11.6	37.76	18.9	11.8	17.62	52.1	11.3	42.43	4.9	11.4	69.05	61.2
12.6	38.21	19.3	12.8	18.16	52.0	12.3	41.98	4.9	12.4	67.73	61.4
13.6	38.60	19.6	13.8	18.69	51.9	13.3	41.54	4.9	13.4	66.43	61.6
14.6	38.97	19.9	14.8	19.20	51.8	14.3	41.12	4.9	14.3	65.15	61.7
15.6	39.32	20.3	15.8	19.68	51.7	15.3	40.71	4.9	15.3	63.92	61.9
16.6	39.70	20.6	16.8	20.15	51.7	16.3	40.31	5.0	16.3	62.73	62.0
17.6	40.09	21.0	17.8	20.62	51.6	17.3	39.91	5.0	17.3	61.58	62.2
18.6	40.53	21.3	18.8	21.08	51.5	18.3	39.52	5.0	18.3	60.44	62.4
19.6	41.00	21.6	19.8	21.56	51.4	19.3	39.12	5.1	19.3	59.29	62.6
20.5	41.51	22.0	20.8	22.06	51.2	20.3	38.71	5.1	20.3	58.11	62.7
21.5	42.02	22.3	21.8	22.58	51.1	21.3	38.28	5.2	21.3	56.87	62.9
22.5	42.52	22.7	22.8	23.13	51.0	22.3	37.84	5.3	22.3	55.57	63.1
23.5	42.97	23.1	23.8	23.70	50.9	23.2	37.38	5.3	23.3	54.20	63.3
24.5	43.37	23.4	24.8	24.28	50.8	24.2	36.91	5.3	24.3	52.78	63.5
25.5	43.69	23.8	25.8	24.85	50.8	25.2	36.45	5.3	25.3	51.34	63.6
26.5	43.95	24.2	26.8	25.41	50.8	26.2	36.00	5.2	26.3	49.91	63.8
27.5	44.14	24.6	27.7	25.94	50.8	27.2	35.57	5.2	27.3	48.50	63.9
28.5	44.32	25.0	28.7	26.45	50.8	28.2	35.15	5.1	28.3	47.15	64.0
29.5	44.49	25.4	29.7	26.95	50.7	29.2	34.74	5.1	29.3	45.85	64.0
30.5	44.67	25.7	30.7	27.42	50.7	30.2	34.34	5.0	30.3	44.60	64.1
31.5	44.88	26.0	31.7	27.88	50.7	31.2	33.95	5.0	31.3	43.38	64.2

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Oct.	h m 1 18	+88° 42′	Oct.	h m 6 47	+87° 12′	Oct.	h m 18 8	+86° 37′	Oct.	h m 19 36	+88° 58′
	s	″		s	″		s	″		s	″
1.5	44.88	26.0	1.7	27.88	50.7	1.2	33.95	5.0	1.3	43.38	4.2
2.5	45.13	26.3	2.7	28.35	50.6	2.2	33.57	5.0	2.3	42.18	4.3
3.5	45.43	26.7	3.7	28.84	50.6	3.2	33.18	5.0	3.3	40.96	4.4
4.5	45.74	27.0	4.7	29.35	50.5	4.2	32.78	4.9	4.3	39.70	4.6
5.5	46.06	27.4	5.7	29.89	50.5	5.2	32.35	4.9	5.3	38.37	4.7
6.5	46.35	27.8	6.7	30.45	50.4	6.2	31.91	4.9	6.3	36.97	4.8
7.5	46.60	28.2	7.7	31.03	50.4	7.2	31.46	4.9	7.3	35.51	4.9
8.5	46.78	28.6	8.7	31.62	50.4	8.2	31.01	4.8	8.3	34.00	5.0
9.5	46.90	29.0	9.7	32.20	50.4	9.2	30.56	4.7	9.3	32.48	5.1
10.5	46.94	29.4	10.7	32.78	50.5	10.2	30.11	4.6	10.3	30.96	5.1
11.5	46.95	29.8	11.7	33.32	50.5	11.2	29.68	4.5	11.3	29.50	5.2
12.5	46.92	30.2	12.7	33.84	50.6	12.2	29.27	4.4	12.3	28.07	5.2
13.5	46.91	30.6	13.7	34.34	50.6	13.2	28.88	4.2	13.3	26.69	5.2
14.5	46.91	30.9	14.7	34.82	50.7	14.2	28.50	4.1	14.3	25.36	5.3
15.5	46.95	31.3	15.7	35.31	50.7	15.2	28.12	4.0	15.3	24.07	5.3
16.5	47.04	31.6	16.7	35.80	50.7	16.2	27.73	3.9	16.3	22.78	5.3
17.5	47.15	32.0	17.7	36.30	50.7	17.2	27.33	3.9	17.3	21.47	5.4
18.5	47.28	32.4	18.7	36.83	50.8	18.2	26.93	3.8	18.2	20.13	5.5
19.5	47.39	32.8	19.7	37.37	50.8	19.2	26.51	3.7	19.2	18.72	5.5
20.5	47.47	33.2	20.7	37.93	50.8	20.2	26.08	3.6	20.2	17.26	5.6
21.5	47.49	33.6	21.7	38.50	50.8	21.2	25.64	3.5	21.2	15.74	5.6
22.5	47.45	34.0	22.7	39.07	50.9	22.2	25.21	3.3	22.2	14.21	5.6
23.5	47.36	34.4	23.7	39.63	51.0	23.2	24.79	3.2	23.2	12.67	5.6
24.5	47.17	34.8	24.7	40.17	51.2	24.2	24.38	3.0	24.2	11.17	5.6
25.5	46.94	35.2	25.7	40.68	51.3	25.2	23.99	2.8	25.2	9.71	5.6
26.4	46.71	35.6	26.7	41.17	51.4	26.2	23.62	2.6	26.2	8.33	5.5
27.4	46.47	35.9	27.7	41.64	51.5	27.2	23.27	2.4	27.2	7.01	5.5
28.4	46.27	36.2	28.7	42.07	51.6	28.2	22.94	2.2	28.2	5.75	5.4
29.4	46.09	36.6	29.7	42.50	51.7	29.2	22.61	2.1	29.2	4.50	5.4
30.4	45.96	36.9	30.7	42.96	51.8	30.1	22.27	1.9	30.2	3.26	5.3
31.4	45.87	37.2	31.7	43.43	51.9	31.1	21.92	1.8	31.2	2.00	5.3
32.4	45.77	37.6	32.7	43.92	52.0	32.1	21.56	1.6	32.2	0.68	5.3

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	1 18	+88 42	Nov.	6 47	+87 12	Nov.	18 8	+86 36	Nov.	19 35	+88 58
	s	″		s	″		s	″		s	″
1.4	45.77	37.6	1.7	43.92	52.0	1.1	21.56	61.6	1.2	60.68	5.3
2.4	45.66	38.0	2.7	44.44	52.1	2.1	21.18	61.5	2.2	59.31	5.3
3.4	45.51	38.4	3.7	44.97	52.2	3.1	20.79	61.3	3.2	57.88	5.3
4.4	45.30	38.8	4.7	45.51	52.3	4.1	20.40	61.1	4.2	56.41	5.2
5.4	45.04	39.2	5.7	46.05	52.4	5.1	20.02	60.9	5.2	54.91	5.2
6.4	44.69	39.6	6.6	46.57	52.6	6.1	19.64	60.7	6.2	53.43	5.1
7.4	44.29	39.9	7.6	47.07	52.8	7.1	19.28	60.4	7.2	51.97	5.0
8.4	43.87	40.3	8.6	47.55	53.0	8.1	18.93	60.2	8.2	50.57	4.9
9.4	43.43	40.7	9.6	48.00	53.2	9.1	18.61	59.9	9.2	49.23	4.7
10.4	43.01	41.0	10.6	48.42	53.3	10.1	18.31	59.7	10.2	47.95	4.6
11.4	42.64	41.3	11.6	48.83	53.5	11.1	18.01	59.4	11.2	46.72	4.5
12.4	42.29	41.6	12.6	49.25	53.7	12.1	17.71	59.2	12.2	45.53	4.4
13.4	41.97	41.9	13.6	49.68	53.8	13.1	17.42	59.0	13.2	44.33	4.3
14.4	41.68	42.3	14.6	50.12	53.9	14.1	17.11	58.8	14.2	43.10	4.2
15.4	41.39	42.6	15.6	50.57	54.1	15.1	16.79	58.6	15.2	41.83	4.2
16.4	41.08	42.9	16.6	51.05	54.2	16.1	16.46	58.4	16.2	40.52	4.1
17.4	40.70	43.3	17.6	51.54	54.4	17.1	16.12	58.2	17.2	39.16	4.0
18.4	40.28	43.7	18.6	52.03	54.6	18.1	15.78	57.9	18.2	37.78	3.8
19.4	39.78	44.0	19.6	52.50	54.8	19.1	15.46	57.6	19.2	36.38	3.7
20.4	39.22	44.4	20.6	52.94	55.0	20.1	15.15	57.3	20.2	35.03	3.5
21.4	38.60	44.7	21.6	53.36	55.3	21.1	14.87	57.0	21.2	33.74	3.4
22.4	37.96	45.0	22.6	53.76	55.6	22.1	14.60	56.7	22.2	32.51	3.2
23.4	37.31	45.3	23.6	54.12	55.8	23.1	14.36	56.4	23.2	31.35	3.0
24.4	36.69	45.6	24.6	54.46	56.0	24.1	14.13	56.1	24.2	30.25	2.8
25.4	36.09	45.9	25.6	54.78	56.3	25.1	13.92	55.8	25.2	29.21	2.6
26.4	35.55	46.1	26.6	55.11	56.5	26.1	13.70	55.6	26.2	28.21	2.4
27.4	35.03	46.4	27.6	55.45	56.7	27.1	13.48	55.3	27.1	27.18	2.2
28.4	34.53	46.7	28.6	55.82	56.9	28.1	13.25	55.0	28.1	26.12	2.1
29.4	34.04	46.9	29.6	56.20	57.1	29.1	13.01	54.8	29.1	25.02	1.9
30.4	33.50	47.3	30.6	56.59	57.3	30.1	12.77	54.5	30.1	23.86	1.8
31.4	32.93	47.6	31.6	56.99	57.6	31.1	12.52	54.2	31.1	22.68	1.6

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Dec.	h m 1 18	° ′ +88 42	Dec.	h m 6 47	° ′ +87 12	Dec.	h m 18 8	° ′ +86 36	Dec.	h m 19 34	° ′ +88 57
	s	″		s	″		s	″		s	″
1.3	32.93	47.6	1.6	56.99	57.6	1.1	12.52	54.2	1.1	82.68	61.6
2.3	32.28	47.9	2.6	57.39	57.8	2.1	12.28	53.9	2.1	81.47	61.4
3.3	31.57	48.2	3.6	57.79	58.1	3.1	12.04	53.6	3.1	80.26	61.2
4.3	30.81	48.5	4.6	58.16	58.4	4.1	11.81	53.2	4.1	79.09	61.0
5.3	30.00	48.8	5.6	58.49	58.7	5.0	11.60	52.9	5.1	77.97	60.7
6.3	29.17	49.0	6.6	58.80	59.0	6.0	11.42	52.5	6.1	76.92	60.5
7.3	28.37	49.3	7.6	59.08	59.3	7.0	11.26	52.2	7.1	75.95	60.2
8.3	27.58	49.5	8.6	59.34	59.6	8.0	11.12	51.9	8.1	75.03	59.9
9.3	26.84	49.7	9.6	59.59	59.8	9.0	10.99	51.6	9.1	74.16	59.7
10.3	26.15	49.9	10.6	59.84	60.1	10.0	10.85	51.2	10.1	73.32	59.5
11.3	25.47	50.1	11.5	60.11	60.3	11.0	10.70	50.9	11.1	72.49	59.3
12.3	24.82	50.3	12.5	60.39	60.6	12.0	10.54	50.7	12.1	71.62	59.0
13.3	24.15	50.6	13.5	60.69	60.8	13.0	10.37	50.4	13.1	70.70	58.8
14.3	23.46	50.8	14.5	61.00	61.1	14.0	10.20	50.1	14.1	69.74	58.6
15.3	22.70	51.1	15.5	61.31	61.4	15.0	10.03	49.7	15.1	68.76	58.4
16.3	21.88	51.3	16.5	61.61	61.7	16.0	9.87	49.4	16.1	67.78	58.1
17.3	21.00	51.5	17.5	61.89	62.0	17.0	9.74	49.0	17.1	66.82	57.8
18.3	20.08	51.8	18.5	62.13	62.3	18.0	9.62	48.6	18.1	65.92	57.5
19.3	19.10	51.9	19.5	62.34	62.7	19.0	9.52	48.3	19.1	65.10	57.2
20.3	18.13	52.1	20.5	62.52	63.0	20.0	9.44	47.9	20.1	64.36	56.9
21.3	17.16	52.3	21.5	62.67	63.4	21.0	9.39	47.5	21.1	63.70	56.6
22.3	16.26	52.4	22.5	62.80	63.7	22.0	9.35	47.2	22.1	63.11	56.3
23.3	15.38	52.5	23.5	62.92	64.0	23.0	9.31	46.8	23.1	62.55	56.0
24.3	14.54	52.6	24.5	63.04	64.3	24.0	9.28	46.5	24.1	62.02	55.7
25.3	13.74	52.8	25.5	63.18	64.5	25.0	9.26	46.2	25.1	61.46	55.4
26.3	12.95	52.9	26.5	63.34	64.8	26.0	9.26	45.9	26.1	60.86	55.2
27.3	12.15	53.1	27.5	63.53	65.1	27.0	9.25	45.6	27.1	60.24	54.9
28.3	11.32	53.2	28.5	63.72	65.4	28.0	9.22	45.3	28.1	59.58	54.6
29.3	10.43	53.4	29.5	63.91	65.7	29.0	9.18	44.9	29.1	58.90	54.3
30.3	9.48	53.6	30.5	64.08	66.1	30.0	9.13	44.6	30.1	58.21	54.0
31.3	8.47	53.7	31.5	64.24	66.4	31.0	9.07	44.2	31.1	57.57	53.7
32.3	7.43	53.8	32.5	64.37	66.8	32.0	9.02	43.8	32.1	56.97	53.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*a* Andromedæ.		*γ* Pegasi. (*Algenib.*)		*β* Hydri		12 Ceti.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 0 2	° ′ +28 27	h m 0 7	° ′ +14 33	h m 0 19	° ′ -77 53	h m 0 24	° ′ - 4 34
	s	″	s	″	s	″	s	″
(Dec. 30.2)	32.43 -.15	64.5 -0.8	24.51 -.13	19.2 -0.8	44.36 -.92	50.9 +0.7	15.69 -.12	61.4 -0.7
Jan. 9.2	32.28 .14	63.5 1.1	24.39 .12	18.3 0.9	43.46 .87	49.9 1.3	15.57 .12	62.1 0.6
19.2	32.14 .13	62.3 1.3	24.27 .11	17.3 1.0	42.62 .80	48.3 1.8	15.46 .11	62.7 0.5
29.2	32.01 .12	60.8 1.5	24.16 .10	16.2 1.1	41.86 .71	46.2 2.4	15.35 .10	63.1 0.4
Feb. 8.1	31.90 .10	59.2 1.6	24.06 .08	15.2 1.1	41.21 .60	43.6 2.8	15.26 .09	63.4 -0.2
18.1	31.81 -.07	57.6 -1.7	23.99 -.06	14.1 -1.0	40.67 -.47	40.6 +3.2	15.18 -.07	63.6 0.0
28.1	31.76 -.04	55.9 1.6	23.94 -.03	13.1 0.9	40.27 .33	37.3 3.4	15.12 .04	63.5 +0.2
Mar. 10.0	31.74 .00	54.3 1.5	23.93 .00	12.2 0.8	40.01 .18	33.7 3.6	15.09 -.01	63.3 0.4
20.0	31.76 +.04	52.8 1.3	23.95 +.04	11.6 0.6	39.91 -.02	30.0 3.8	15.10 +.02	62.8 0.6
30.0	31.83 .09	51.6 1.1	24.01 .08	11.1 -0.3	39.96 +.13	26.2 3.8	15.14 .06	62.1 0.8
Apr. 9.0	31.94 +.14	50.6 -0.8	24.11 +.12	10.9 0.0	40.18 +.29	22.4 +3.7	15.22 +.10	61.1 +1.1
18.9	32.10 .18	49.9 0.5	24.25 .16	11.1 +0.3	40.54 .45	18.7 3.6	15.35 .14	59.9 1.3
28.9	32.30 .22	49.7 -0.1	24.44 .20	11.5 0.6	41.07 .59	15.2 3.4	15.51 .18	58.5 1.5
May 8.9	32.54 .26	49.8 +0.3	24.66 .24	12.2 0.9	41.73 .72	11.9 3.1	15.71 .22	56.9 1.7
18.8	32.82 .29	50.3 0.7	24.91 .27	13.3 1.2	42.52 .85	9.0 2.8	15.94 .25	55.1 1.9
28.8	33.13 +.31	51.2 +1.1	25.19 +.29	14.6 +1.5	43.43 +.95	6.4 +2.4	16.21 +.28	53.2 +2.0
June 7.8	33.45 .33	52.4 1.4	25.49 .30	16.2 1.7	44.42 1.03	4.3 1.9	16.49 .29	51.1 2.0
17.8	33.78 .33	54.0 1.7	25.80 .31	18.0 1.9	45.49 1.09	2.6 1.4	16.80 .30	49.1 2.0
27.7	34.12 .33	55.9 2.0	26.12 .31	20.0 2.0	46.60 1.11	1.5 0.8	17.10 .31	47.1 2.0
July 7.7	34.44 .32	58.0 2.2	26.42 .30	22.1 2.1	47.72 1.11	0.9 +0.3	17.41 .30	45.1 1.9
17.7	34.75 +.30	60.3 +2.3	26.72 +.28	24.2 +2.1	48.82 1.08	0.9 -0.3	17.71 +.29	43.3 +1.7
27.7	35.04 .27	62.6 2.4	26.99 .26	26.3 2.1	49.88 1.02	1.5 0.9	17.90 .27	41.7 1.5
Aug. 6.6	35.29 .24	65.1 2.5	27.24 .23	28.4 2.0	50.86 .92	2.7 1.4	18.24 .24	40.2 1.3
16.6	35.52 .20	67.6 2.4	27.45 .20	30.3 1.9	51.73 .80	4.4 1.9	18.47 .21	39.0 1.1
26.6	35.70 .16	70.0 2.4	27.63 .16	32.2 1.7	52.46 .66	6.5 2.3	18.66 .18	38.1 0.8
Sept. 5.5	35.84 +.12	72.3 +2.3	27.77 +.12	33.8 +1.6	53.04 +.49	9.0 -2.7	18.82 +.14	37.5 +0.5
15.5	35.94 .08	74.5 2.1	27.88 .08	35.3 1.4	53.44 .31	11.8 2.9	18.94 .10	37.1 +0.2
25.5	36.00 +.04	76.6 1.9	27.94 .05	36.5 1.0	53.65 +.12	14.8 3.1	19.02 .07	37.0 0.0
Oct. 5.5	36.02 .00	78.4 1.7	27.97 +.01	37.6 0.9	53.68 -.07	18.0 3.1	19.07 +.03	37.1 -0.2
15.4	36.01 -.03	80.0 1.5	27.97 -.02	38.4 0.7	53.51 .26	21.0 3.0	19.08 .00	37.4 0.4
25.4	35.96 -.06	81.3 +1.2	27.94 -.04	38.9 +0.5	53.17 -.43	23.9 -2.8	19.07 -.03	38.0 -0.6
Nov. 4.4	35.89 .08	82.4 0.9	27.88 .07	39.3 +0.2	52.66 .58	26.6 2.5	19.02 .05	38.6 0.7
14.4	35.80 .10	83.1 0.6	27.80 .09	39.4 0.0	52.00 .71	28.8 2.0	18.96 .07	39.4 0.8
24.3	35.68 .12	83.6 +0.3	27.71 .10	39.4 -0.2	51.24 .81	30.6 1.5	18.88 .09	40.2 0.8
Dec. 4.3	35.55 .14	83.7 0.0	27.60 .11	39.1 0.4	50.39 .88	31.9 0.9	18.78 .10	41.0 0.8
14.3	35.41 -.14	83.6 -0.3	27.48 -.12	38.6 -0.6	49.48 -.91	32.5 -0.3	18.68 -.11	41.8 -0.8
24.2	35.26 .15	83.1 0.6	27.36 .12	38.0 0.7	48.56 .92	32.5 +0.3	18.56 .12	42.6 0.7
34.2	35.12 -.15	82.3 -0.9	27.24 -.12	37.2 -0.9	47.65 -.90	31.9 +0.9	18.45 -.11	43.3 -0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Cassiopeæ.		*β* Ceti.		21 Cassiopeæ.		*ε* Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 0 34	° ′ +55 54	h m 0 37	° ′ −18 36	h m 0 38	° ′ +74 21	h m 0 57	° ′ + 7 16
	s	″	s	″	s	″	s	″
(Dec.30.3)	6.21 −.30	74.3 −0.2	54.39 −.14	38.0 −0.6	13.13 −.74	87.4 +0.3	4.40 −.12	49.4 −0.7
Jan. 9.2	5.92 .30	73.8 0.7	54.25 .13	38.5 0.4	12.40 .73	87.4 −0.4	4.28 .12	48.7 0.7
19.2	5.62 .29	72.9 1.2	54.12 .13	38.8 −0.2	11.67 .71	86.7 1.0	4.15 .13	48.0 0.7
29.2	5.34 .27	71.4 1.6	54.00 .12	38.8 +0.1	10.98 .67	85.4 1.5	4.03 .12	47.2 0.7
Feb. 8.1	5.08 .24	69.6 2.0	53.89 .10	38.6 0.4	10.34 .60	83.7 2.0	3.91 .11	46.5 0.7
18.1	4.85 −.20	67.4 −2.3	53.79 −.08	38.1 +0.6	9.79 −.50	81.5 −2.4	3.80 −.09	45.9 −0.6
28.1	4.68 .15	65.0 2.5	53.72 .06	37.3 0.9	9.35 .38	78.9 2.7	3.72 .07	45.4 0.5
Mar. 10.1	4.56 .08	62.5 2.6	53.68 −.03	36.2 1.2	9.03 .25	76.0 2.9	3.66 .04	45.0 0.3
20.1	4.51 −.01	59.9 2.5	53.67 +.01	34.9 1.4	8.86 −.10	73.0 3.0	3.63 −.01	44.8 −0.1
30.0	4.54 +.06	57.4 2.4	53.70 .05	33.4 1.7	8.84 +.06	70.0 3.0	3.64 +.03	44.8 +0.1
Apr. 9.0	4.63 +.13	55.0 −2.2	53.76 +.09	31.6 +1.9	8.97 +.21	67.1 −2.8	3.69 +.07	45.0 +0.3
19.0	4.80 .21	52.9 1.9	53.87 .13	29.6 2.1	9.26 .36	64.3 2.6	3.78 .11	45.5 0.6
29.0	5.05 .28	51.2 1.5	54.03 .17	27.5 2.2	9.69 .49	62.0 2.2	3.92 .16	46.2 0.9
May 8.9	5.35 .34	49.9 1.1	54.22 .21	25.2 2.3	10.24 .61	60.0 1.8	4.09 .20	47.2 1.1
18.9	5.72 .39	49.1 0.6	54.45 .25	22.9 2.3	10.90 .71	58.4 1.3	4.31 .23	48.5 1.4
28.9	6.13 +.43	48.7 −0.1	54.71 +.28	20.6 +2.3	11.66 +.78	57.4 −0.7	4.56 +.26	50.0 +1.6
June 7.8	6.57 .45	48.8 +0.4	55.00 .30	18.2 2.3	12.47 .84	56.9 −0.2	4.83 .28	51.6 1.7
17.8	7.03 .47	49.4 0.9	55.30 .31	16.0 2.2	13.33 .86	57.0 +0.3	5.13 .30	53.4 1.9
27.8	7.50 .47	50.6 1.3	55.62 .32	14.0 2.0	14.20 .87	57.6 0.9	5.43 .31	55.3 1.9
July 7.8	7.97 .46	52.1 1.8	55.94 .32	12.1 1.7	15.07 .84	58.7 1.4	5.74 .31	57.3 2.0
17.7	8.42 +.44	54.1 +2.1	56.25 +.31	10.5 +1.5	15.90 +.81	60.4 +1.9	6.04 +.30	59.2 +1.9
27.7	8.84 .41	56.4 2.4	56.55 .29	9.2 1.1	16.69 .76	62.5 2.3	6.33 .28	61.1 1.8
Aug. 6.7	9.23 .36	59.0 2.7	56.82 .26	8.2 0.8	17.41 .68	65.0 2.7	6.61 .26	62.9 1.7
16.6	9.57 .32	61.9 2.9	57.07 .23	7.6 0.5	18.05 .59	67.9 3.0	6.85 .23	64.5 1.6
26.6	9.86 .27	64.9 3.1	57.29 .20	7.3 +0.1	18.60 .49	71.0 3.3	7.07 .20	66.0 1.4
Sept. 5.6	10.10 +.21	68.1 +3.2	57.46 +.16	7.4 −0.2	19.04 +.39	74.4 +3.5	7.25 +.17	67.3 +1.2
15.6	10.28 .15	71.3 3.2	57.60 .12	7.8 0.5	19.37 .26	78.0 3.6	7.40 .13	68.3 0.9
25.5	10.40 .09	74.5 3.2	57.70 .08	8.5 0.8	19.59 .16	81.6 3.6	7.52 .10	69.1 0.7
Oct. 5.5	10.47 +.04	77.6 3.1	57.76 .04	9.4 1.1	19.69 +.04	85.2 3.6	7.60 .06	69.7 0.5
15.5	10.48 −.02	80.6 2.9	57.79 +.01	10.6 1.2	19.67 −.08	88.8 3.5	7.65 +.03	70.1 +0.2
25.5	10.44 −.07	83.4 +2.7	57.78 −.02	11.9 −1.3	19.53 −.19	92.2 +3.3	7.67 .00	70.2 0.0
Nov. 4.4	10.34 .12	85.9 2.4	57.74 .05	13.2 1.4	19.29 .30	95.4 3.1	7.66 −.02	70.2 −0.1
14.4	10.20 .16	88.1 2.0	57.68 .07	14.6 1.4	18.93 .41	98.3 2.7	7.62 .05	70.0 0.3
24.4	10.02 .20	89.9 1.6	57.60 .09	16.0 1.3	18.47 .50	100.9 2.3	7.56 .07	69.7 0.4
Dec. 4.3	9.80 .24	91.3 1.2	57.49 .11	17.2 1.2	17.92 .59	102.9 1.8	7.49 .09	69.2 0.5
14.3	9.55 −.26	92.2 +0.7	57.38 −.12	18.3 −1.0	17.29 −.65	104.5 +1.3	7.40 −.10	68.7 −0.6
24.3	9.27 .28	92.6 +0.2	57.25 .13	19.2 0.8	16.61 .70	105.4 0.7	7.29 .11	68.1 0.6
34.3	8.98 −.30	92.5 −0.4	57.13 −.13	19.8 −0.5	15.89 −.73	105.8 +0.1	7.17 −.12	67.4 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Andromedæ.		θ¹ Ceti.		38 Cassiopeæ.		η Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 1 3	+35° 1′	h m 1 18	− 8° 45′	h m 1 22	+69° 40′	h m 1 25	+14° 45′
	s	″	s	″	s	″	s	″
(Dec.30.3)	24.44 −.16	21.2 −0.2	22.18 −.12	70.5 −0.8	51.35 −.50	69.3 +0.8	26.14 −.12	44.4 −0.5
Jan. 9.3	24.27 .17	20.7 0.6	22.05 .13	71.3 0.7	50.84 .53	69.8 +0.2	26.01 .13	43.8 0.6
19.2	24.10 .18	20.0 0.9	21.92 .13	71.9 0.5	50.29 .54	69.7 −0.4	25.88 .14	43.1 0.7
29.2	23.92 .17	18.9 1.2	21.79 .13	72.3 0.3	49.75 .53	69.0 1.0	25.74 .14	42.3 0.8
Feb. 8.2	23.75 .16	17.6 1.4	21.66 .12	72.5 −0.1	49.23 .50	67.7 1.5	25.60 .13	41.5 0.8
18.1	23.60 −.14	16.1 −1.6	21.54 −.11	72.5 +0.1	48.75 −.45	66.0 −1.9	25.47 −.12	40.6 −0.8
28.1	23.48 .11	14.4 1.7	21.44 .09	72.3 0.3	48.33 .38	63.8 2.3	25.36 .10	39.8 0.7
Mar. 10.1	23.39 .07	12.7 1.7	21.36 .06	71.8 0.6	47.99 .28	61.3 2.6	25.27 .07	39.1 0.6
20.1	23.34 −.03	11.0 1.6	21.31 −.03	71.1 0.8	47.76 .18	58.6 2.8	25.21 −.04	38.6 0.5
30.0	23.33 +.02	9.5 1.5	21.30 +.01	70.2 1.1	47.64 −.06	55.8 2.8	25.20 .00	38.1 0.3
Apr. 9.0	23.38 +.07	8.1 −1.3	21.32 +.05	69.0 +1.3	47.63 +.06	53.0 −2.8	25.22 +.04	37.9 −0.1
19.0	23.48 .13	6.9 1.0	21.39 .09	67.6 1.5	47.75 .18	50.3 2.6	25.28 .09	37.9 +0.1
29.0	23.63 .18	6.1 0.7	21.50 .13	66.0 1.7	47.99 .29	47.8 2.3	25.40 .14	38.1 0.4
May 8.9	23.84 .22	5.6 −0.3	21.66 .17	64.1 1.9	48.34 .40	45.6 2.0	25.56 .18	38.7 0.7
18.9	24.08 .26	5.4 +0.1	21.85 .21	62.2 2.0	48.80 .50	43.8 1.6	25.75 .22	39.5 0.9
28.9	24.37 +.30	5.6 +0.4	22.08 +.24	60.1 +2.1	49.34 +.57	42.5 −1.1	25.99 +.25	40.5 +1.2
June 7.8	24.69 .33	6.3 0.8	22.34 .27	58.0 2.1	49.95 .64	41.6 0.6	26.26 .28	41.8 1.4
17.8	25.03 .35	7.3 1.2	22.62 .29	55.8 2.1	50.61 .68	41.3 −0.1	26.55 .30	43.3 1.6
27.8	25.38 .35	8.6 1.5	22.92 .30	53.7 2.0	51.31 .70	41.4 +0.4	26.85 .31	45.0 1.7
July 7.8	25.73 .35	10.2 1.7	23.23 .31	51.7 1.9	52.02 .71	42.1 0.9	27.16 .31	46.8 1.8
17.7	26.08 +.34	12.1 +2.0	23.53 +.30	49.8 +1.8	52.73 +.70	43.3 +1.4	27.48 +.31	48.7 +1.9
27.7	26.42 .32	14.1 2.2	23.83 .29	48.2 1.5	53.42 .67	44.9 1.8	27.78 .30	50.6 1.9
Aug. 6.7	26.73 .30	16.4 2.3	24.11 .27	46.8 1.3	54.07 .63	46.9 2.2	28.07 .28	52.4 1.8
16.6	27.01 .27	18.7 2.4	24.37 .25	45.7 1.0	54.67 .57	49.3 2.6	28.33 .25	54.2 1.7
26.6	27.27 .23	21.1 2.4	24.60 .22	44.9 0.7	55.22 .51	52.1 2.9	28.57 .22	55.9 1.6
Sept. 5.6	27.48 +.20	23.5 +2.4	24.81 +.19	44.4 +0.4	55.69 +.44	55.1 +3.1	28.78 +.19	57.5 +1.5
15.6	27.66 .16	25.9 2.3	24.98 .15	44.2 0.0	56.09 .36	58.3 3.3	28.96 .16	58.9 1.3
25.5	27.80 .12	28.2 2.2	25.11 .12	44.3 −0.3	56.41 .27	61.7 3.4	29.11 .13	60.0 1.1
Oct. 5.5	27.90 .08	30.3 2.1	25.21 .08	44.7 0.5	56.64 .19	65.1 3.4	29.22 .10	61.0 0.9
15.5	27.96 .04	32.3 1.9	25.28 .05	45.3 0.7	56.78 +.09	68.5 3.4	29.30 .06	61.8 0.7
25.5	27.98 +.01	34.1 +1.7	25.32 +.02	46.1 −0.9	56.83 .00	71.9 +3.3	29.35 +.03	62.4 +0.5
Nov. 4.4	27.97 −.03	35.7 1.5	25.32 −.01	47.1 1.0	56.79 −.09	75.1 3.1	29.37 +.01	62.8 0.3
14.4	27.93 .06	37.0 1.2	25.30 .03	48.1 1.1	56.65 .18	78.1 2.9	29.36 −.02	63.1 +0.1
24.4	27.86 .08	38.0 0.9	25.26 .06	49.2 1.1	56.43 .26	80.6 2.5	29.33 .05	63.1 0.0
Dec. 4.3	27.76 .11	38.8 0.6	25.19 .08	50.3 1.1	56.13 .34	83.2 2.1	29.27 .07	63.0 −0.2
14.3	27.64 −.13	39.2 +0.3	25.10 −.10	51.4 −1.0	55.75 −.41	85.1 +1.6	29.19 −.09	62.8 −0.3
24.3	27.49 .15	39.3 −0.1	25.00 .11	52.3 0.9	55.31 .47	86.5 1.1	29.09 .11	62.4 0.4
34.3	27.33 −.17	39.1 −0.4	24.88 −.12	53.2 −0.8	54.81 −.52	87.3 +0.6	28.97 −.12	61.9 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Eridani. (*Achernar.*)		*o* Piscium.		β Arietis.		50 Cassiopeæ.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 1 33	−57° 48′	h m 1 39	+ 8° 35′	h m 1 48	+20° 15′	h m 1 53	+71° 52′
	s	″	s	″	s	″	s	″
(Dec.30.3)	29.45 −.32	63.7 −0.8	25.55 −.11	13.6 −0.6	23.98 −.12	17.5 −0.3	50.02 −.53	36.7 +1.2
Jan. 9.3	29.12 .33	64.2 −0.2	25.43 .13	13.0 0.7	23.86 .14	17.1 0.5	49.46 .58	37.7 +0.6
19.2	28.78 .33	64.1 +0.4	25.30 .13	12.3 0.7	23.71 .15	16.5 0.7	48.86 .61	38.0 0.0
29.2	28.45 .32	63.5 0.9	25.16 .14	11.6 0.7	23.56 .15	15.7 0.8	48.23 .62	37.7 −0.5
Feb. 8.2	28.14 .30	62.3 1.4	25.02 .13	11.0 0.6	23.41 .15	14.9 0.8	47.61 .60	36.9 1.1
18.1	27.84 −.28	60.6 +1.9	24.89 −.12	10.4 −0.6	23.26 −.14	14.1 −0.9	47.03 −.56	35.6 −1.6
28.1	27.59 .24	58.4 2.4	24.78 .10	9.9 0.5	23.13 .12	13.1 0.9	46.49 .49	33.7 2.0
Mar. 10.1	27.37 .19	55.8 2.7	24.68 .08	9.5 0.3	23.02 .10	12.2 0.9	46.05 .40	31.5 2.4
20.1	27.21 .13	52.9 3.0	24.61 .05	9.3 −0.2	22.94 .06	11.4 0.8	45.70 .29	29.0 2.6
30.0	27.10 .07	49.8 3.3	24.58 −.01	9.2 0.0	22.90 −.02	10.7 0.6	45.47 .17	26.3 2.8
Apr. 9.0	27.06 −.01	46.4 +3.5	24.59 +.03	9.3 +0.2	22.89 +.02	10.1 −0.4	45.37 −.03	23.5 −2.8
19.0	27.09 +.06	42.8 3.5	24.64 .07	9.6 0.4	22.94 .07	9.8 −0.2	45.40 +.11	20.7 2.7
29.0	27.19 .13	39.3 3.6	24.74 .12	10.2 0.7	23.03 .12	9.7 0.0	45.58 .24	18.1 2.5
May 8.9	27.36 .20	35.7 3.5	24.88 .16	11.1 1.0	23.17 .16	9.8 +0.3	45.88 .36	15.7 2.2
18.9	27.59 .27	32.3 3.4	25.06 .20	12.2 1.2	23.36 .20	10.2 0.6	46.30 .48	13.6 1.9
28.9	27.90 +.33	29.0 +3.2	25.28 +.24	13.5 +1.4	23.58 +.24	10.9 +0.8	46.83 +.58	11.9 −1.5
June 7.8	28.25 .38	26.0 2.9	25.53 .27	15.0 1.6	23.84 .27	11.9 1.1	47.46 .66	10.6 1.0
17.8	28.66 .42	23.2 2.5	25.81 .29	16.6 1.7	24.13 .30	13.1 1.3	48.15 .72	9.8 −0.5
27.8	29.10 .45	20.9 2.1	26.11 .30	18.4 1.8	24.44 .31	14.5 1.5	48.90 .76	9.5 0.0
July 7.8	29.56 .47	19.1 1.6	26.41 .31	20.3 1.9	24.75 .32	16.1 1.6	49.68 .79	9.7 +0.5
17.7	30.04 +.48	17.7 +1.1	26.72 +.30	22.1 +1.8	25.07 +.32	17.8 +1.7	50.47 +.79	10.4 +0.9
27.7	30.52 .47	16.9 +0.5	27.02 .29	24.0 1.8	25.39 .31	19.6 1.8	51.26 .77	11.6 1.4
Aug. 6.7	30.98 .45	16.7 0.0	27.31 .28	25.7 1.7	25.69 .29	21.5 1.8	52.02 .74	13.2 1.8
16.6	31.42 .42	17.0 −0.6	27.58 .26	27.3 1.5	25.98 .27	23.3 1.8	52.74 .70	15.2 2.2
26.6	31.83 .38	17.9 1.2	27.83 .23	28.8 1.4	26.24 .25	25.1 1.7	53.41 .64	17.6 2.6
Sept. 5.6	32.18 +.32	19.3 −1.7	28.04 +.20	30.0 +1.2	26.47 +.22	26.8 +1.6	54.02 +.57	20.4 +2.9
15.6	32.47 .26	21.2 2.1	28.23 .17	31.1 1.0	26.68 .19	28.3 1.5	54.55 .49	23.4 3.1
25.5	32.70 .19	23.5 2.5	28.39 .14	32.0 0.7	26.85 .16	29.7 1.3	54.99 .40	26.6 3.3
Oct. 5.5	32.86 .13	26.1 2.7	28.51 .11	32.6 0.5	26.99 .12	31.0 1.2	55.35 .31	29.9 3.4
15.5	32.95 +.05	29.0 2.9	28.60 .08	33.0 0.3	27.10 .09	32.1 1.0	55.60 .21	33.3 3.4
25.5	32.97 −.01	32.0 −2.9	28.67 +.05	33.2 +0.1	27.17 +.06	33.0 +0.8	55.76 +.10	36.7 +3.4
Nov. 4.4	32.92 .08	34.9 2.8	28.70 +.02	33.2 −0.1	27.22 +.03	33.7 0.6	55.81 .00	40.1 3.3
14.4	32.81 .14	37.7 2.7	28.70 −.01	33.1 0.2	27.23 .00	34.3 0.5	55.76 −.11	43.2 3.1
24.4	32.64 .19	40.3 2.4	28.68 .03	32.8 0.3	27.22 −.03	34.6 0.3	55.60 .21	46.2 2.8
Dec. 4.3	32.42 .24	42.5 2.0	28.63 .06	32.4 0.4	27.17 .05	34.8 +0.1	55.33 .31	48.8 2.5
14.3	32.16 −.28	44.3 −1.6	28.57 −.08	31.9 −0.5	27.11 −.08	34.9 −0.1	54.98 −.40	51.1 +2.0
24.3	31.87 .30	45.7 1.1	28.48 .10	31.4 0.6	27.01 .10	34.7 0.2	54.53 .49	52.9 1.5
34.3	31.55 −.32	46.5 −0.6	28.37 −.12	30.8 −0.6	26.90 −.12	34.4 −0.4	54.01 −.57	54.2 +1.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Arietis.		ξ¹ Ceti.		ι Cassiopeæ.		ξ² Ceti.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 2 0	° ′ +22 55	h m 2 6	° ′ + 8 18	h m 2 19	° ′ +66 53	h m 2 22	° ′ + 7 57
	s	″	s	″	s	″	s	″
(Dec.30.3)	48.43 −.12	38.5 −0.2	60.75 −.10	52.2 0.6	47.41 −.37	45.5 +1.3	9.25 −.10	4.4 −0.6
Jan. 9.3	48.31 .14	38.2 0.4	60.64 .12	51.6 0.6	47.01 .42	46.6 0.8	9.14 .12	3.7 0.6
19.2	48.16 .15	37.7 0.6	60.51 .14	51.0 0.6	46.57 .46	47.2 +0.3	9.02 .13	3.1 0.6
29.2	48.01 .16	37.0 0.7	60.37 .14	50.4 0.6	46.10 .48	47.2 −0.3	8.87 .15	2.5 0.6
Feb. 8.2	47.85 .16	36.2 0.8	60.22 .15	49.8 0.6	45.61 .48	46.7 0.8	8.72 .15	2.0 0.5
18.2	47.69 −.15	35.3 −0.9	60.07 −.14	49.2 −0.5	45.14 −.46	45.6 −1.3	8.57 −.15	1.5 −0.5
28.2	47.54 .14	34.4 1.0	59.94 .13	48.8 0.4	44.70 .41	44.1 1.7	8.43 .13	1.0 0.4
Mar. 10.1	47.42 .11	33.4 0.9	59.82 .10	48.4 0.3	44.32 .35	42.2 2.1	8.30 .11	0.7 0.2
20.1	47.33 .08	32.5 0.9	59.73 .07	48.2 −0.1	44.00 .27	39.9 2.3	8.20 .09	0.6 −0.1
30.1	47.27 −.04	31.7 0.8	59.67 −.04	48.2 0.0	43.78 .18	37.5 2.5	8.13 .05	0.5 +0.1
Apr. 9.1	47.26 +.01	31.0 −0.6	59.66 .00	48.3 +0.2	43.65 −.08	34.9 −2.6	8.09 −.01	0.7 +0.3
19.0	47.29 .06	30.5 0.4	59.68 +.05	48.6 0.5	43.63 +.03	32.3 2.6	8.10 +.03	1.0 0.5
29.0	47.37 .11	30.2 −0.2	59.75 .09	49.2 0.7	43.71 .14	29.8 2.4	8.16 .08	1.6 0.7
May 9.0	47.51 .15	30.1 +0.1	59.86 .14	50.0 0.9	43.91 .25	27.4 2.2	8.26 .12	2.4 0.9
18.9	47.68 .20	30.3 0.4	60.02 .18	51.1 1.1	44.21 .35	25.4 1.9	8.40 .17	3.4 1.1
28.9	47.90 +.24	30.9 +0.6	60.22 +.22	52.3 +1.3	44.61 +.43	23.6 −1.5	8.59 +.20	4.7 +1.3
June 7.9	48.16 .27	31.6 0.9	60.45 .25	53.7 1.5	45.08 .51	22.3 1.1	8.81 .24	6.1 1.5
17.9	48.44 .30	32.7 1.1	60.72 .27	55.3 1.6	45.62 .57	21.4 0.7	9.07 .27	7.6 1.6
27.8	48.75 .31	33.9 1.4	61.00 .29	57.0 1.7	46.21 .61	20.9 −0.2	9.35 .29	9.3 1.7
July 7.8	49.07 .32	35.4 1.5	61.30 .30	58.8 1.8	46.84 .64	20.9 +0.2	9.64 .30	11.0 1.7
17.8	49.39 +.32	37.0 +1.7	61.61 +.30	60.6 +1.8	47.49 +.65	21.4 +0.7	9.94 +.30	12.8 +1.7
27.7	49.71 .32	38.7 1.7	61.91 .30	62.4 1.7	48.14 .65	22.3 1.1	10.25 .30	14.5 1.7
Aug. 6.7	50.03 .30	40.5 1.8	62.21 .29	64.0 1.6	48.79 .63	23.7 1.5	10.54 .29	16.2 1.6
16.7	50.32 .28	42.3 1.8	62.49 .27	65.6 1.5	49.40 .60	25.4 1.9	10.83 .28	17.7 1.4
26.7	50.59 .26	44.1 1.8	62.75 .25	67.0 1.3	49.99 .56	27.5 2.2	11.10 .26	19.0 1.3
Sept. 5.6	50.84 +.23	45.8 +1.7	62.99 +.22	68.2 +1.1	50.53 +.51	29.9 +2.5	11.34 +.23	20.2 +1.1
15.6	51.06 .20	47.4 1.6	63.20 .20	69.2 0.9	51.01 .45	32.6 2.8	11.56 .21	21.2 0.8
25.6	51.25 .17	48.9 1.4	63.38 .17	70.0 0.7	51.44 .39	35.5 3.0	11.76 .18	21.9 0.6
Oct. 5.6	51.40 .14	50.3 1.3	63.53 .14	70.6 0.5	51.79 .32	38.6 3.1	11.92 .15	22.4 0.4
15.5	51.52 .11	51.5 1.1	63.65 .11	70.9 0.3	52.08 .25	41.7 3.2	12.06 .12	22.7 +0.2
25.5	51.62 +.08	52.6 +1.0	63.74 +.08	71.1 +0.1	52.28 +.17	44.9 +3.2	12.16 +.09	22.8 0.0
Nov. 4.5	51.67 .04	53.5 0.8	63.80 .05	71.0 −0.1	52.41 +.08	48.0 3.1	12.24 .06	22.8 −0.1
14.4	51.70 +.01	54.2 0.6	63.83 +.02	70.9 0.2	52.45 .00	51.1 3.0	12.29 +.03	22.6 0.3
24.4	51.70 −.02	54.7 0.4	63.83 −.01	70.6 0.3	52.41 −.08	53.9 2.7	12.30 .00	22.2 0.4
Dec. 4.4	51.67 .05	55.0 0.3	63.81 .04	70.2 0.4	52.28 .17	56.5 2.4	12.29 −.03	21.8 0.5
14.4	51.61 −.07	55.2 +0.1	63.76 −.06	69.7 −0.5	52.07 −.25	58.8 +2.1	12.25 −.05	21.3 −0.5
24.3	51.52 .10	55.2 −0.1	63.68 .09	69.1 0.6	51.78 .32	60.7 1.7	12.19 .08	20.7 0.6
34.3	51.41 −.13	55.0 −0.3	63.58 −.11	68.6 −.06	51.43 −.38	62.1 +1.1	12.09 −.10	20.1 −0.6

- APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Ceti.		α Ceti.		48 Cephei (H.)		ζ Arietis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 2 37	° ′ + 2 45	h m 2 56	° ′ + 3 38	h m 3 5	° ′ +77 18	h m 3 8	° ′ +20 37
	s	″	s	″	s	″	s	″
(Dec. 30.3)	26.92 −.09	24.0 −0.8	22.65 −.08	36.3 −0.7	64.83 −.58	71.6 +2.2	24.88 −.08	25.7 −0.1
Jan. 9.3	26.82 .11	23.3 0.7	22.55 .11	35.6 0.7	64.18 .72	73.6 1.6	24.79 .11	25.6 0.2
19.2	26.69 .13	22.6 0.6	22.44 .13	34.9 0.6	63.40 .82	75.0 1.1	24.66 .13	25.3 0.3
29.2	26.55 .15	22.0 0.5	22.30 .15	34.3 0.5	62.54 .89	75.8 +0.5	24.52 .16	25.0 0.4
Feb. 8.2	26.40 .15	21.5 0.4	22.14 .16	33.8 0.4	61.63 .92	76.1 0.0	24.35 .17	24.6 0.5
18.2	26.24 −.15	21.1 −0.3	21.98 −.16	33.4 −0.3	60.70 −.91	75.7 −0.6	24.18 −.17	24.0 −0.5
28.2	26.09 .14	20.9 −0.2	21.83 .15	33.1 0.2	59.80 .87	74.8 1.2	24.01 .17	23.5 0.6
Mar. 10.1	25.96 .12	20.8 0.0	21.68 .14	33.0 −0.1	58.96 .78	73.3 1.7	23.84 .15	22.9 0.6
20.1	25.85 .10	20.8 +0.1	21.55 .11	33.0 +0.1	58.23 .66	71.4 2.1	23.70 .13	22.2 0.6
30.1	25.76 .07	21.0 0.3	21.45 .08	33.2 0.3	57.63 .52	69.1 2.4	23.59 .10	21.7 0.5
Apr. 9.1	25.71 −.03	21.5 +0.5	21.39 −.04	33.6 +0.5	57.19 −.35	66.6 −2.7	23.51 −.06	21.2 −0.4
19.0	25.71 +.01	22.1 0.8	21.36 .00	34.1 0.7	56.93 −.17	63.8 2.8	23.47 −.01	20.8 0.3
29.0	25.74 .06	23.0 1.0	21.38 +.04	34.9 0.9	56.86 +.02	61.0 2.8	23.49 +.04	20.6 −0.1
May 9.0	25.83 .11	24.1 1.2	21.45 .09	35.9 1.1	56.97 .21	58.3 2.7	23.55 .09	20.5 +0.1
19.0	25.96 .15	25.3 1.4	21.56 .13	37.1 1.3	57.28 .39	55.6 2.5	23.66 .13	20.7 0.3
28.9	26.13 +.19	26.8 +1.5	21.71 +.17	38.5 +1.4	57.76 +.56	53.2 −2.3	23.82 +.18	21.1 +0.5
June 7.9	26.33 .23	28.4 1.7	21.91 .21	40.0 1.6	58.40 .71	51.1 1.9	24.02 .22	21.7 0.7
17.9	26.57 .26	30.2 1.8	22.14 .24	41.6 1.7	59.18 .84	49.3 1.5	24.25 .25	22.5 0.9
27.8	26.84 .28	31.9 1.8	22.39 .27	43.4 1.7	60.08 .95	48.0 1.1	24.52 .28	23.4 1.1
July 7.8	27.12 .29	33.8 1.8	22.67 .28	45.1 1.8	61.07 1.03	47.1 0.7	24.81 .30	24.6 1.2
17.8	27.42 +.30	35.6 +1.8	22.96 +.29	46.9 +1.7	62.14 +1.08	46.7 −0.2	25.12 +.31	25.8 +1.3
27.7	27.72 .30	37.3 1.7	23.26 .30	48.6 1.6	63.24 1.12	46.7 +0.3	25.43 .31	27.2 1.4
Aug. 6.7	28.01 .29	38.9 1.5	23.55 .29	50.1 1.5	64.37 1.12	47.3 0.7	25.75 .31	28.6 1.4
16.7	28.30 .28	40.3 1.3	23.84 .28	51.5 1.3	65.49 1.11	48.2 1.2	26.06 .30	30.0 1.4
26.7	28.57 .26	41.5 1.1	24.12 .27	52.7 1.1	66.58 1.07	49.7 1.6	26.36 .29	31.4 1.4
Sept. 5.6	28.82 +.24	42.5 +0.9	24.38 +.25	53.7 +0.9	67.63 +1.01	51.5 +2.0	26.64 +.27	32.7 +1.3
15.6	29.05 .22	43.2 0.6	24.62 .23	54.5 0.6	68.61 .94	53.7 2.4	26.90 .25	33.9 1.2
25.6	29.26 .19	43.7 0.3	24.84 .21	55.0 0.4	69.50 .85	56.2 2.7	27.15 .23	35.1 1.1
Oct. 5.6	29.43 .16	43.9 +0.1	25.04 .18	55.2 +0.1	70.30 .74	59.1 2.9	27.36 .20	36.1 0.9
15.5	29.58 .13	43.9 −0.1	25.20 .15	55.2 −0.1	70.98 .61	62.1 3.1	27.55 .18	36.9 0.8
25.5	29.70 +.10	43.7 −0.3	25.34 +.12	55.0 −0.3	71.52 +.48	65.4 +3.3	27.72 +.15	37.7 +0.7
Nov. 4.5	29.79 .07	43.2 0.5	25.45 .09	54.6 0.5	71.93 .32	68.7 3.3	27.85 .12	38.3 0.5
14.4	29.85 .04	42.7 0.6	25.53 .06	54.0 0.6	72.17 +.16	72.1 3.3	27.95 .09	38.8 0.4
24.4	29.88 +.01	42.0 0.7	25.57 +.03	53.4 0.7	72.26 .00	75.4 3.2	28.02 .05	39.1 0.3
Dec. 4.4	29.88 −.02	41.3 0.7	25.59 .00	52.7 0.7	72.17 −.17	78.6 3.1	28.05 +.01	39.4 0.2
14.4	29.85 −.05	40.5 −0.8	25.58 −.03	51.9 −0.7	71.92 −.34	81.5 +2.8	28.05 −.02	39.5 +0.1
24.3	29.79 .07	39.7 0.8	25.53 .06	51.2 0.7	71.50 .49	84.2 2.4	28.02 .05	39.6 0.0
34.3	29.70 −.10	39.0 −0.7	25.46 −.09	50.4 −0.7	70.93 −.64	86.4 +2.0	27.94 −.09	39.5 −0.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Persei.		ε Eridani.		δ Persei.		η Tauri.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 3 16	+49° 27′	h m 3 27	− 9° 50′	h m 3 34	+47° 25′	h m 3 40	+23° 45′
	s	″	s	″	s	″	s	″
(Dec.30.4)	16.58 −.13	31.3 +1.2	36.80 −.07	40.8 −1.3	54.00 −.10	31.5 +1.2	46.68 −.05	13.0 +0.1
Jan. 9.3	16.43 .17	32.3 0.9	36.71 .10	42.0 1.1	53.87 .15	32.6 0.9	46.60 .09	13.1 0.0
19.3	16.23 .22	33.0 0.5	36.59 .13	43.0 0.9	53.70 .19	33.4 0.6	46.49 .13	13.0 −0.1
29.3	16.00 .25	33.3 +0.1	36.45 .15	43.8 0.7	53.48 .23	33.8 +0.3	46.35 .15	12.9 0.2
Feb. 8.2	15.74 .27	33.2 −0.2	36.28 .17	44.4 0.4	53.24 .25	33.9 −0.1	46.19 .17	12.6 0.3
18.2	15.46 −.27	32.8 −0.6	36.11 −.17	44.7 −0.2	52.98 −.26	33.6 −0.4	46.01 −.18	12.3 −0.4
28.2	15.19 .26	32.0 1.0	35.94 .17	44.7 +0.1	52.72 .26	33.0 0.8	45.82 .18	11.8 0.5
Mar. 10.2	14.93 .24	30.8 1.3	35.77 .16	44.5 0.3	52.46 .24	32.1 1.1	45.64 .17	11.3 0.6
20.1	14.71 .21	29.4 1.5	35.62 .14	44.0 0.6	52.23 .21	30.9 1.3	45.47 .15	10.7 0.6
30.1	14.52 .16	27.8 1.7	35 49 .11	43.3 0.9	52.03 .17	29.5 1.5	45.33 .12	10.1 0.6
Apr. 9.1	14.39 −.10	26.1 −1.8	35.39 −.08	42.3 +1.1	51.89 −.12	27.9 −1.6	45.23 −.09	9.5 −0.5
19.1	14.32 −.04	24.3 1.8	35.33 −.04	41.1 1.4	51.80 −.06	26.3 1.6	45.16 −.04	9.0 0.4
29.0	14.32 +.03	22.6 1.7	35.31 .00	39 6 1.6	51.77 +.01	24.7 1.6	45.14 +.01	8.6 0.3
May 9.0	14.38 .10	20.9 1.6	35.33 +.05	37.9 1.8	51.81 .07	23.1 1.5	45.17 .06	8.4 −0.2
19.0	14.51 .16	19.4 1.4	35.41 .09	36.0 1.9	51.92 .14	21.7 1.3	45.25 .10	8.3 0.0
28.9	14.71 +.23	18.1 −1.1	35.52 +.14	34.0 +2.1	52.08 +.19	20.5 −1.1	45.38 +.15	8.4 +0.2
June 7.9	14.97 .28	17.1 0.8	35.68 .18	31.9 2.2	52.31 .25	19.4 0.9	45.56 .19	8.6 0.4
17.9	15.28 .33	16.5 0.5	35.88 .21	29.7 2.2	52.59 .30	18.7 0.6	45.77 .23	9.1 0.6
27.9	15.63 .37	16.1 −0.2	36.11 .24	27.5 2.2	52.92 .34	18.3 −0.3	46.03 .26	9.8 0.7
July 7.8	16.01 .40	16.0 +0.1	36.36 .26	25.3 2.1	53.28 .37	18.1 0.0	46.30 .29	10.6 0.9
17.8	16.42 +.42	16.3 +0.4	36.63 +.28	23.3 +1.9	53.67 +.39	18.3 +0.3	46.60 +.31	11.6 +1.0
27.8	16.85 .43	16.9 0.7	36.92 .29	21.5 1.7	54.07 .40	18.7 0.6	46.91 .32	12.6 1.1
Aug. 6.8	17.28 .43	17.8 1.0	37.21 .29	19.9 1.5	54.48 .41	19.5 0.9	47.23 .32	13.8 1.2
16.7	17.70 .42	19.0 1.3	37.50 .29	18.5 1.2	54.90 .41	20.4 1.1	47.55 .32	15.0 1.2
26.7	18.12 .40	20.4 1.5	37.78 .28	17.5 0.9	55.30 .40	21.7 1.3	47.86 .31	16.2 1.2
Sept. 5.7	18.51 +.38	22.0 +1.7	38.05 +.26	16.8 +0.5	55.69 +.38	23.1 +1.5	48.17 +.29	17.4 +1.1
15.6	18.88 .36	23.9 1.9	38.31 .25	16.5 +0.1	56.07 .36	24.7 1.7	48.45 .28	18.5 1.1
25.6	19.23 .33	25.8 2.0	38.55 .22	16.5 −0.2	56.42 .34	26.4 1.8	48.72 .26	19.5 1.9
Oct. 5.6	19.54 .29	27.9 2.2	38.76 .20	16.9 0.6	56.74 .30	28.2 1.9	48.97 .24	20.5 0.9
15.6	19.81 .25	30.1 2.2	38.95 .17	17.6 0.9	57.03 .27	30.2 1.9	49.20 .21	21.4 0.8
25.5	20.04 +.21	32.3 +2.2	39.11 +.15	18.7 −1.1	57.28 +.23	32.1 +2.0	49.46 +.18	22.1 +0.7
Nov. 4.5	20.23 .17	34.5 2.2	39.24 .12	19.9 1.3	57.49 .19	34.1 2.0	49.57 .15	22.8 0.6
14.5	20.37 .12	36.6 2.1	39.34 .08	21.2 1.4	57.66 .14	36.1 1.9	49.71 .12	23.4 0.5
24.5	20.47 .07	38.7 2.0	39.41 .05	22.7 1.5	57.78 .09	38.0 1.9	49.81 .09	23.9 0.5
Dec. 4.4	20.51 +.01	40.6 1.9	39.44 +.02	24.3 1.5	57.85 +.04	39.9 1.8	49.88 .05	24.3 0.4
14.4	20.49 −.04	42.4 +1.6	39.44 −.01	25.8 −1.4	57.86 −.01	41.6 +1.6	49.91 +.01	24.7 +0.3
24.4	20.43 .09	43.9 1.4	39.41 .05	27.2 1.3	57.82 .06	43.1 1.4	49.90 −.03	24.9 0.2
34.4	20.31 −.14	45.2 +1.1	39.35 −.09	28.4 −1.2	57.73 −.12	44.4 +1.1	49.85 −.07	25.1 +0.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Persei.		γ Eridani.		γ Tauri.		ε Tauri.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 3 47	+31° 32′	h m 3 52	−13° 49′	h m 4 13	+15° 21′	h m 4 22	+18° 55′
	s	″	s	″	s	″	s	″
(Dec.30.4)	2.54 −.05	46.4 +0.5	46.00 −.06	63.8 −1.5	22.44 −.02	6.8 −0.2	1.81 −.02	37.2 −0.1
Jan. 9.3	2.46 .10	46.8 0.4	45.93 .09	65.2 1.3	22.40 .06	6.6 0.3	1.77 .06	37.1 0.1
19.3	2.34 .14	47.1 +0.2	45.82 .12	66.4 1.1	22.31 .10	6.3 0.3	1.69 .10	37.0 0.1
29.3	2.19 .16	47.2 0.0	45.68 .15	67.4 0.8	22.20 .13	6.0 0.3	1.57 .13	36.8 0.2
Feb. 8.3	2.01 .19	47.1 −0.2	45.52 .17	68.1 0.5	22.05 .16	5.7 0.3	1.43 .16	36.6 0.2
18.2	1.82 −.20	46.8 −0.4	45.34 −.18	68.4 −0.2	21.88 −.17	5.4 −0.3	1.26 −.13	36.4 −0.2
28.2	1.61 .20	46.4 0.5	45.16 .18	68.5 +0.1	21.70 .18	5.1 0.3	1.07 .18	36.1 0.3
Mar. 10.2	1.41 .19	45.7 0.7	44.98 .18	68.3 0.4	21.52 .18	4.9 0.3	0.89 .18	35.8 0.3
20.2	1.23 .17	45.0 0.8	44.81 .16	67.8 0.6	21.35 .16	4.6 0.2	0.71 .17	35.5 0.3
30.1	1.07 .14	44.2 0.9	44.66 .13	67.0 0.9	21.20 .14	4.4 0.2	0.55 .15	35.3 0.3
Apr. 9.1	0.95 −.10	43.3 −0.9	44.54 −.10	66.0 +1.2	21.07 −.11	4.3 −0.1	0.42 −.12	35.0 −0.2
19.1	0.87 −.05	42.4 0.8	44.45 .06	64.6 1.5	20.98 .07	4.2 0.0	0.32 .08	34.8 0.2
29.0	0.85 .00	41.6 0.7	44.41 −.02	63.0 1.7	20.94 −.02	4.3 +0.1	0.26 −.03	34.7 −0.1
May 9.0	0.87 +.05	40.9 0.6	44.41 +.02	61.2 1.9	20.93 +.02	4.5 0.3	0.25 +.02	34.7 +0.1
19.0	0.95 .09	40.3 0.5	44.46 .07	59.2 2.1	20.98 .07	4.8 0.4	0.29 .06	34.8 0.2
29.0	1.08 +.15	40.0 −0.3	44.55 +.11	57.0 +2.2	21.07 +.11	5.3 +0.6	0.38 +.11	35.1 +0.3
June 7.9	1.26 .20	39.8 −0.1	44.68 .15	54.7 2.3	21.21 .16	6.0 0.7	0.51 .15	35.5 0.5
17.9	1.48 .24	39.8 +0.1	44.86 .19	52.4 2.3	21.39 .20	6.8 0.9	0.68 .19	36.1 0.6
27.9	1.75 .28	40.0 0.3	45.07 .23	50.1 2.3	21.60 .23	7.7 1.0	0.90 .23	36.8 0.8
July 7.9	2.04 .30	40.5 0.5	45.31 .25	47.8 2.2	21.84 .26	8.8 1.1	1.14 .25	37.6 0.9
17.8	2.35 +.32	41.1 +0.7	45.57 +.27	45.7 +2.0	22.11 +.28	9.9 +1.1	1.41 +.28	38.5 +0.9
27.8	2.68 .33	41.9 0.9	45.85 .28	43.8 1.8	22.39 .29	11.0 1.1	1.69 .29	39.5 1.0
Aug. 6.8	3.02 .34	42.8 1.0	46.14 .29	42.0 1.5	22.69 .30	12.1 1.1	1.99 .30	40.5 1.0
16.7	3.36 .34	43.9 1.1	46.44 .29	40.7 1.2	22.99 .30	13.2 1.1	2.30 .31	41.5 1.0
26.7	3.70 .33	45.0 1.2	46.73 .29	39.6 0.8	23.29 .30	14.3 1.0	2.60 .30	42.4 0.9
Sept. 5.7	4.02 +.32	46.2 +1.2	47.01 +.26	39.0 +0.5	23.59 +.29	15.2 +0.9	2.90 +.30	43.3 +0.8
15.7	4.33 .30	47.4 1.2	47.28 .28	38.7 +0.1	23.87 .28	16.0 0.7	3.20 .29	44.1 0.7
25.6	4.62 .28	48.7 1.2	47.53 .24	38.8 −0.3	24.15 .27	16.6 0.6	3.48 .28	44.8 0.6
Oct. 5.6	4.89 .26	49.9 1.2	47.76 .22	39.4 0.7	24.40 .25	17.1 0.4	3.75 .26	45.3 0.5
15.6	5.14 .23	51.1 1.2	47.97 .20	40.3 1.0	24.64 .23	17.4 0.3	4.00 .24	45.8 0.3
25.6	5.36 +.20	52.2 +1.1	48.16 +.17	41.5 −1.3	24.86 +.20	17.6 +0.1	4.23 +.22	46.1 +0.3
Nov. 4.5	5.55 .17	53.3 1.1	48.31 .14	42.9 1.5	25.05 .18	17.7 0.0	4.43 .19	46.3 0.2
14.5	5.70 .14	54.3 1.0	48.44 .11	44.6 1.7	25.22 .15	17.7 −0.1	4.61 .16	46.5 0.1
24.5	5.82 .10	55.3 0.9	48.53 .08	46.3 1.8	25.35 .11	17.6 0.1	4.76 .13	46.6 +0.1
Dec. 4.4	5.90 .06	56.2 0.8	48.59 +.04	48.1 1.8	25.45 .08	17.4 0.2	4.87 .09	46.6 0.0
14.4	5.94 +.02	57.0 +0.7	48.61 .00	49.9 −1.7	25.51 +.04	17.2 −0.2	4.94 +.05	46.6 0.0
24.4	5.94 −.03	57.7 0.6	48.60 −.03	51.6 1.6	25.53 .00	17.0 0.2	4.97 +.01	46.5 0.0
34.4	5.89 −.07	58.2 +0.5	48.55 −.07	53.1 −1.4	25.52 −.04	16.7 −0.2	4.96 −.03	46.5 −0.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Tauri. (*Aldebaran.*)		*α* Camelopardalis.		*ι* Aurigæ.		11 Orionis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 4 29	° ′ +16 16	h m 4 42	° ′ +66 8	h m 4 49	° ′ +32 59	h m 4 58	° ′ +15 14
	s	″	s	″	s	″	s	″
(Dec.30.4)	26.91 −.01	44.9 −0.2	51.47 −.08	55.8 +2.4	39.04 +.01	4.7 +0.7	7.47 +.01	36.5 −0.3
Jan. 9.4	26.88 .05	44.7 0.2	51.34 .18	58.1 2.1	39.02 −.05	5.4 0.6	7.46 −.03	36.2 0.3
19.4	26.80 .09	44.5 0.2	51.11 .27	60.1 1.8	38.95 .09	6.0 0.5	7·41 .07	36.0 0.2
29.4	26.69 .13	44.2 0.2	50.79 .35	61.7 1.4	38.83 .13	6.5 0.4	7.32 .11	35.7 0.2
Feb. 8.3	26.55 .15	44.0 0.2	50.41 .41	62.9 1.0	38.68 .17	6.8 0.2	7.19 .14	35.5 0.2
18.3	26.39 −.17	43.8 −0.2	49.97 −.46	63.7 +0.5	38.49 −.20	6.9 +0.1	7.03 −.17	35.4 −0.2
28.2	26.21 .18	43.5 0.2	49.49 .48	64.0 0.0	38.29 .21	6.9 −0.1	6.85 .18	35.2 0.2
Mar. 10.2	26.02 .18	43.3 0.2	49.00 .48	63.8 −0.4	38.07 .21	6.7 0.3	6.67 .18	35.0 0.1
20.2	25.84 .17	43.0 0.2	48.53 .45	63.1 0.9	37.86 .20	6.4 0.4	6.48 .18	34.9 0.1
30.2	25.68 .15	42.8 0.2	48.10 .41	62.0 1.3	37.66 .18	5.9 0.6	6.31 .16	34.8 −0.1
Apr. 9.1	25.55 −.12	42.7 −0.1	47.72 −.34	60.5 −1.7	37.49 −.15	5.3 −0.7	6.16 −.14	34.8 0.0
19.1	25.44 .08	42.6 0.0	47.42 .26	58.7 1.9	37.36 .11	4.6 0.7	6.04 .10	34.8 0.0
29.1	25.38 −.04	42.6 +0.1	47.20 .16	56.6 2.1	37.27 .06	3.8 0.7	5.96 .06	34.9 +0.1
May 9.1	25.37 +.01	42.8 0.2	47.09 −.06	54.4 2.3	37.23 −.01	3.1 0.7	5.91 −.02	35.0 0.2
19.0	25.40 .05	43.1 0.3	47.07 +.04	52.1 2.3	37.25 +.04	2.4 0.6	5.92 +.03	35.3 0.4
29.0	25.48 +.10	43.5 +0.5	47.16 +.14	49.8 −2.2	37.31 +.09	1.8 −0.5	5.97 +.07	35.8 +0.5
June 8.0	25.60 .14	44.0 0.6	47.35 .24	47.6 2.1	37.43 .14	1.3 0.4	6.06 .12	36.3 0.6
17.9	25.76 .18	44.7 0.8	47.64 .33	45.6 1.9	37.60 .19	1.0 0.3	6.20 .16	37.0 0.7
27.9	25.96 .22	45.5 0.9	48.02 .42	43.7 1.7	37.80 .23	0.8 −0.1	6.38 .19	37.7 0.8
July 7.9	26.20 .25	46.4 1.0	48.47 .49	42.2 1.4	38.05 .26	0.7 0.0	6.58 .22	38.6 0.9
17.9	26.46 +.27	47.4 +1.0	48.99 +.54	40.9 −1.1	38.33 +.29	0.8 +0.2	6.82 +.25	39.4 +0.9
27.8	26.73 .28	48.4 1.0	49.56 .59	40.0 0.8	38.63 .31	1.1 0.3	7.08 .27	40.4 0.9
Aug. 6.8	27.02 .30	49.4 1.0	50.18 .63	39.4 −0.4	38.95 .33	1.4 0.4	7.36 .28	41.3 0.9
16.8	27.32 .30	50.4 1.0	50.82 .65	39.1 0.0	39.29 .34	1.9 0.5	7.65 .29	42.1 0.8
26.8	27.63 .30	51.4 0.9	51.47 .66	39.2 +0.3	39.63 .34	2.5 0.6	7.94 .30	42.9 0.7
Sept. 5.7	27.92 +.29	52.2 +0.8	52.14 +.66	39.7 +0.6	39.97 +.34	3.1 +0.7	8.24 +.30	43.6 +0 6
15.7	28.21 .29	52.9 0 7	52.79 .65	40.5 1.0	40.30 .33	3.8 0.7	8.54 .29	44.2 0.5
25.7	28.50 .28	53.5 0.5	53.43 .63	41.7 1.3	40.63 .32	4.5 0.7	8.83 .28	44.6 0.3
Oct. 5.6	28.76 .26	54.0 0.4	54.04 .60	43.2 1.6	40.95 .31	5.3 0.8	9.11 .27	44.8 +0.1
15.6	29.01 .24	54.2 0.2	54.62 .55	44.9 1.9	41.25 .29	6.0 0.8	9.37 .26	45.0 −0.1
25.6	29.25 +.22	54.4 +0.1	55.15 +.50	46.9 +2.1	41.53 +.27	6.8 +0.8	9.62 +.24	45.0 −0.2
Nov. 4.6	29.45 .20	54.5 0.0	55.63 .44	49.2 2.4	41.79 .24	7.6 0.8	9.86 .22	44.8 0.2
14.5	29.64 .17	54.4 −0.1	56.03 .37	51.7 2.5	42.02 .21	8.4 0.8	10.06 .19	44.6 0.3
24.5	29.79 .13	54.3 0.2	56.36 .28	54.2 2.6	42.22 .18	9.2 0.8	10.24 .16	44.3 0.3
Dec. 4.5	29 90 .10	54.1 0.2	56.60 .19	56.9 2.7	42.37 .13	10.1 0.8	10.38 .13	44.0 0.3
14.5	29.98 +.06	53.9 −0.2	56.74 +.09	59.6 +2.6	42.48 +.09	10.9 +0.8	10.49 +.09	43.7 −0.3
24.4	30.02 +.02	53.7 0.2	56.78 −.01	62.2 2.5	42.55 +.04	11.7 0.8	10.56 +.04	43.4 0.3
34.4	30.01 −.02	53.5 −0.2	56.72 −.12	64.6 +2.4	42.56 −.01	12.4 +0.7	10.58 .00	43.1 −0.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Aurigæ. (*Capella.*)		β Orionis. (*Rigel.*)		β Tauri.		Groombridge 966.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 5 8	° ′ +45 52	h m 5 9	° ′ − 8 19	h m 5 19	° ′ +28 30	h m 5 24	° ′ +74 57
	s	″	s	″	s	″	s	″
(Dec. 30.4)	21.74 +.02	49.9 +1.5	7.22 +.01	70.3 −1.6	9.82 +.04	32.3 +0.5	41.57 −.02	57.0 +2.9
Jan. 9.4	21.73 −.04	51.3 1.3	7.21 −.03	71.8 1.4	9.84 −.01	32.7 0.4	41.46 .18	59.8 2.7
19.4	21.65 .10	52.6 1.2	7.15 .07	73.2 1.2	9.80 .06	33.2 0.4	41.20 .34	62.4 2.4
29.4	21.52 .16	53.7 1.0	7.06 .11	74.3 1.0	9.71 .11	33.5 0.3	40.78 .48	64.7 2.1
Feb. 8.3	21.34 .20	54.5 0.7	6.93 .14	75.2 0.8	9.58 .15	33.9 0.3	40.24 .60	66.6 1.7
18.3	21.12 −.24	55.1 +0.4	6.77 −.17	75.9 −0.5	9.42 −.18	34.1 +0.2	39.58 −.69	68.1 +1.2
28.3	20.87 .26	55.4 +0.1	6.59 .18	76.3 −0.3	9.23 .20	34.2 0.0	38.85 .75	69.0 0.7
Mar. 10.2	20.61 .26	55.4 −0.1	6.40 .19	76.4 0.0	9.03 .20	34.2 −0.1	38.08 .78	69.4 +0.1
20.2	20.34 .26	55.1 0.4	6.21 .18	76.3 +0.2	8.82 .20	34.0 0.2	37.30 .76	69.3 −0.4
30.2	20.09 .24	54.5 0.7	6.03 .17	76.0 0.5	8.62 .19	33.8 0.3	36.55 .72	68.6 0.9
Apr. 9.2	19.87 −.20	53.6 −0.9	5.87 −.15	75.4 +0.7	8.45 −.16	33.5 −0.4	35.86 −.64	67.4 −1.4
19.1	19.69 .16	52.6 1.1	5.74 .12	74.5 1.0	8.30 .13	33.0 0.4	35.27 .53	65.8 1.8
29.1	19.56 .10	51.4 1.3	5.64 .08	73.4 1.2	8.20 .08	32.6 0.4	34.79 .41	63.8 2.1
May 9.1	19.48 −.04	50.1 1.3	5.58 −.04	72.1 1.4	8.13 −.04	32.1 0.4	34.44 .27	61.5 2.4
19.1	19.47 +.02	48.7 1.3	5.56 .00	70.6 1.6	8.12 +.01	31.7 0.4	34.24 −.12	59.0 2.5
29.0	19.52 +.08	47.4 −1.3	5.58 +.05	68.9 +1.7	8.15 +.06	31.3 −0.3	34.20 +.04	56.5 −2.6
June 8.0	19.62 .14	46.1 1.2	5.65 .09	67.1 1.9	8.23 .11	31.0 0.2	34.32 .19	53.8 2.6
18.0	19.79 .19	45.0 1.1	5.76 .13	65.2 1.9	8.37 .15	30.8 −0.1	34.58 .34	51.3 2.5
27.9	20.01 .24	44.0 0.9	5.91 .17	63.2 2.0	8.54 .19	30.8 0.0	34.99 .47	48.9 2.3
July 7.9	20.28 .29	43.1 0.8	6.09 .20	61.2 2.0	8.75 .22	30.8 +0.1	35.53 .60	46.6 2.1
17.9	20.58 +.32	42.4 −0.6	6.30 +.22	59.3 +1.9	8.99 +.26	30.9 +0.2	36.19 +.71	44.6 −1.8
27.9	20.92 .35	42.0 0.4	6.54 .24	57.5 1.7	9.26 .28	31.1 0.3	36.95 .80	42.9 1.5
Aug. 6.8	21.29 .38	41.7 −0.2	6.79 .26	55.8 1.5	9.56 .30	31.4 0.3	37.80 .88	41.5 1.2
16.8	21.68 .39	41.6 0.0	7.06 .27	54.4 1.3	9.86 .31	31.8 0.4	38.72 .94	40.5 0.8
26.8	22.07 .40	41.8 +0.2	7.34 .28	53.3 1.0	10.18 .32	32.1 0.4	39.68 .98	39.9 −0.5
Sept. 5.8	22.48 +.40	42.1 +0.4	7.62 +.28	52.5 +0.6	10.51 +.32	32.6 +0.4	40.68 1.01	39.6 0.0
15.7	22.88 .40	42.6 0.6	7.90 .28	52.0 +0.3	10.83 .32	33.0 0.4	41.70 1.02	39.8 +0.3
25.7	23.28 .39	43.2 0.7	8.18 .27	51.9 −0.1	11.15 .32	33.4 0.4	42.72 1.01	40.3 0.7
Oct. 5.7	23.67 .38	44.0 0.9	8.45 .26	52.2 0.5	11.47 .31	33.8 0.4	43.71 .98	41.3 1.1
15.6	24.04 .36	45.0 1.0	8.70 .25	52.8 0.8	11.78 .30	34.2 0.4	44.67 .93	42.6 1.5
25.6	24.39 +.34	46.0 +1.1	8.94 +.23	53.8 −1.1	12.07 +.28	34.5 +0.4	45.58 +.87	44.3 +1.9
Nov. 4.6	24.71 .31	47.2 1.3	9.16 .21	55.1 1.4	12.34 .26	34.9 0.4	46.40 .78	46.3 2.2
14.6	25.01 .27	48.6 1.4	9.37 .18	56.5 1.5	12.59 .23	35.3 0.4	47.13 .68	48.7 2.5
24.5	25.26 .23	50.0 1.5	9.54 .15	58.2 1.7	12.80 .20	35.7 0.4	47.75 .55	51.3 2.7
Dec. 4.5	25.46 .18	51.5 1.5	9.67 .12	59.9 1.7	12.99 .16	36.1 0.4	48.23 .41	54.1 2.9
14.5	25.61 +.12	53.0 +1.5	9.77 +.08	61.6 −1.7	13.13 +.12	36.5 +0.5	48.57 +.26	57.0 +3.0
24.5	25.71 +.06	54.6 1.5	9.83 +.04	63.3 1.7	13.22 .07	37.0 0.5	48.75 +.09	60.0 2.9
34.4	25.74 .00	56.1 +1.5	9.85 .00	64.9 −1.6	13.27 +.02	37.5 +0.5	48.76 −.07	62.9 +2.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*δ* Orionis.		*α* Leporis.		*ε* Orionis.		*α* Columbæ.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 5 26	° ′ − 0 22	h m 5 27	° ′ −17 54	h m 5 30	° ′ − 1 16	h m 5 35	° ′ −34 7
	s	″	s	″	s	″	s	″
(Dec.30.4)	14.81 +.03	71.5 −1.2	45.69 +.02	26.1 −2.1	29.57 +.03	40.1 −1.3	34.68 .00	75.9 −2.8
Jan. 9.4	14.82 −.01	72.7 1.1	45.68 −.03	28.2 1.9	29.58 −.01	41.4 1.2	34.65 −.05	81.6 2.5
19.4	14.79 .06	73.7 1.0	45.63 .07	30.0 1.7	29.55 .05	42.5 1.0	34.57 .10	84.0 2.2
29.4	14.71 .10	74.6 0.8	45.54 .11	31.5 1.4	29.47 .09	43.4 0.8	34.45 .15	86.1 1.9
Feb. 8.3	14.59 .13	75.3 0.6	45.40 .15	32.8 1.1	29.36 .13	44.2 0.7	34.28 .19	87.8 1.5
18.3	14.45 −.16	75.9 −0.4	45.24 −.17	33.7 −0.8	29.22 −.16	44.7 −0.5	34.08 −.22	89.0 −1.1
28.3	14.28 .17	76.2 0.3	45.05 .19	34.3 0.4	29.05 .17	45.1 0.3	33.85 .24	89.9 0.6
Mar. 10.3	14.10 .18	76.4 −0.1	44.85 .20	34.6 −0.1	28.87 .18	45.3 −0.1	33.60 .25	90.3 −0.2
20.2	13.91 .18	76.4 +0.1	44.65 .20	34.5 +0.2	28.68 .18	45.3 +0.1	33.36 .25	90.2 +0.3
30.2	13.73 .17	76.2 0.3	44.45 .19	34.1 0.6	28.50 .17	45.1 0.3	33.11 .23	89.7 0.7
Apr. 9.2	13.57 −.15	75.8 +0.5	44.27 −.17	33.3 +0.9	28.34 −.15	44.7 +0.5	32.89 −.21	88.7 +1.2
19.1	13.43 .12	75.3 0.6	44.11 .14	32.3 1.2	28.20 .12	44.1 0.7	32.68 .18	87.4 1.5
29.1	13.33 .09	74.6 0.8	43.99 .11	31.0 1.5	28.09 .09	43.4 0.8	32.52 .15	85.6 1.9
May 9.1	13.26 .05	73.6 1.0	43.90 .07	29.3 1.7	28.02 .05	42.4 1.0	32.39 .11	83.6 2.2
19.1	13.23 −.01	72.6 1.1	43.85 −.02	27.5 2.0	27.99 −.01	41.3 1.2	32.31 .06	81.2 2.5
29.0	13.25 +.04	71.4 +1.3	43.85 +.02	25.4 +2.2	28.00 +.03	40.1 +1.3	32.27 −.01	78.6 +2.7
June 8.0	13.31 .08	70.0 1.4	43.89 .06	23.2 2.3	28.05 .07	38.7 1.4	32.28 +.04	75.8 2.9
18.0	13.41 .12	68.5 1.5	43.98 .10	20.9 2.4	28.15 .11	37.2 1.5	32.34 .08	72.8 3.0
28.0	13.55 .15	67.0 1.5	44.10 .14	18.5 2.4	28.28 .15	35.6 1.6	32.45 .13	69.8 3.0
July 7.9	13.72 .19	65.4 1.6	44.26 .18	16.1 2.3	28.45 .18	34.0 1.6	32.60 .17	66.9 2.9
17.9	13.92 +.21	63.9 +1.5	44.46 +.21	13.8 +2.2	28.64 +.21	32.4 +1.5	32.79 +.21	64.1 +2.7
27.9	14.14 .24	62.4 1.4	44.68 .23	11.7 2.0	28.87 .23	30.9 1.4	33.01 .24	61.4 2.5
Aug. 6.8	14.39 .26	61.0 1.3	44.92 .25	9.7 1.8	29.11 .25	29.5 1.3	32.26 .26	59.1 2.2
16.8	14.66 .27	59.8 1.1	45.19 .27	8.1 1.5	29.37 .27	28.3 1.1	33.54 .29	57.1 1.8
26.8	14.93 .28	58.9 0.9	45.46 .28	6.8 1.1	29.64 .27	27.3 0.9	33.84 .30	55.5 1.3
Sept. 5.8	15.21 +.28	58.1 +0.6	45.74 +.28	5.9 +0.7	29.92 +.28	26.6 +0.6	34.14 +.31	54.4 +0.8
15.7	15.49 .28	57.7 +0.3	46.03 .29	5.4 +0.3	30.20 .28	26.1 +0.3	34.46 .31	53.9 +0.3
25.7	15.77 .28	57.5 0.0	46.32 .28	5.3 −0.2	30.48 .28	26.0 0.0	34.77 .31	53.9 −0.3
Oct. 5.7	16.05 .27	57.6 −0.3	46.60 .26	5.7 0.6	30.76 .27	26.2 −0.3	35.08 .30	54.5 0.8
15.7	16.31 .26	58.1 0.6	46.87 .26	6.6 1.1	31.03 .26	26.6 0.6	35.38 .29	55.6 1.4
25.6	16.57 +.24	58.8 −0.8	47.12 +.25	7.9 −1.4	31.28 +.25	27.4 −0.9	35.66 +.27	57.2 −1.8
Nov. 4.6	16.80 .23	59.7 1.0	47.36 .24	9.5 1.7	31.52 .23	28.3 1.1	35.92 .24	59.3 2.2
14.6	17.02 .20	60.8 1.2	47.57 .20	11.4 2.0	31.74 .21	29.5 1.2	36.15 .21	61.7 2.6
24.5	17.21 .17	62.1 1.3	47.75 .17	13.5 2.2	31.93 .18	30.8 1.3	36.34 .17	64.4 2.8
Dec. 4.5	17.37 .14	63.4 1.3	47.90 .13	15.7 2.3	32.10 .14	32.2 1.4	36.49 .13	67.3 2.9
14.5	17.49 +.10	64.7 −1.3	48.01 +.09	18.0 −2.2	32.22 +.10	33.6 −1.4	36.60 +.08	70.3 −2.9
24.5	17.57 .06	66.0 1.3	48.08 +.05	20.2 2.2	32.31 .06	35.0 1.3	36.66 +.03	73.2 2.8
34.4	17.61 +.02	67.3 −1.2	48.10 .00	22.3 −2.1	32.35 +.02	36.3 −1.2	36.67 −.02	76.0 −2.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Orionis.		ν Orionis.		22 Camelop. (H.)		μ Geminorum.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 5 49	+ 7° 22′	h m 6 1	+14° 46′	h m 6 6	+69° 21′	h m 6 16	+22° 34′
	s	″	s	″	s	″	s	″
(Dec.30.5)	4.06 +.06	56.7 −0.9	8.09 +.07	42.4 −0.4	26.05 +.13	21.0 +2.7	8.33 +.10	5.0 0.0
Jan. 9.5	4.09 +.01	55.9 0.8	8.14 +.03	42.0 0.4	26.11 .00	23.7 2.6	8.40 +.04	5.0 +0.1
19.4	4.08 −.03	55.2 0.6	8.14 −.02	41.7 0.3	26.04 −.13	26.2 2.5	8.42 −.01	5.1 0.2
29.4	4.02 .02	54.6 0.5	8.09 .07	41.5 0.2	25.85 .25	28.6 2.2	8.39 .06	5.3 0.2
Feb. 8.4	3.93 .12	54.1 0.4	8.00 .11	41.3 −0.1	25.55 .35	30.7 1.9	8.31 .10	5.6 0.2
18.4	3.79 −.15	53.8 −0.3	7.88 −.14	41.3 0.0	25.15 −.44	32.5 +1.6	8.18 −.14	5.8 +0.2
28.3	3.63 .17	53.6 0.2	7.72 .17	41.2 0.0	24.68 .50	33.9 1.1	8.03 .17	6.0 0.2
Mar. 10.3	3.45 .18	53.5 −0.1	7.54 .18	41.2 0.0	24.14 .54	34.7 0.6	7.85 .19	6.2 0.2
20.3	3.27 .18	53.5 0.0	7.36 .19	41.3 +0.1	23.59 .56	35.1 +0.1	7.66 .19	6.4 0.1
30.3	3.09 .17	53.6 +0.2	7.17 .18	41.3 0.1	23.03 .54	35.0 −0.4	7.46 .19	6.5 +0.1
Apr. 9.2	2.92 −.16	53.8 +0.3	7.00 −.16	41.4 +0.1	22.50 −.50	34.4 −0.8	7.27 −.18	6.5 0.0
19.2	2.77 .13	54.1 0.4	6.84 .14	41.6 0.1	22.02 .44	33.3 1.3	7.11 .15	6.5 0.0
29.2	2.66 .10	54.5 0.5	6.72 .11	41.7 0.2	21.61 .36	31.9 1.5	6.97 .12	6.4 −0.1
May 9.2	2.58 .06	55.0 0.6	6.63 .07	42.0 0.3	21.29 .27	30.1 1.9	6.87 .06	6.4 −0.1
19.1	2.54 −.02	55.7 0.7	6.58 −.03	42.3 0.3	21.07 .17	28.0 2.2	6.81 −.04	6.3 0.0
29.1	2.54 +.02	56.5 +0.8	6.57 +.02	42.6 +0.4	20.96 −.06	25.7 −2.3	6.79 .00	6.3 0.0
June 8.1	2.58 .06	57.3 0.9	6.61 .06	43.1 0.5	20.96 +.05	23.3 2.4	6.82 +.05	6.2 0.0
18.0	2.66 .10	58.3 1.0	6.69 .10	43.6 0.5	21.07 .17	20.9 2.4	6.89 .09	6.3 0.0
28.0	2.79 .14	59.3 1.0	6.81 .14	44.2 0.6	21.29 .27	18.6 2.3	7.00 .13	6.3 +0.1
July 8.0	2.95 .17	60.4 1.1	6.96 .17	44.8 0.6	21.62 .37	16.3 2.2	7.15 .17	6.5 0.1
18.0	3.14 +.20	61.5 +1.1	7.15 +.20	45.4 +0.7	22.03 +.46	14.1 −2.0	7.33 +.20	6.6 +0.2
27.9	3.35 .23	62.6 1.0	7.36 .23	46.1 0.6	22.53 .54	12.2 1.8	7.54 .23	6.8 0.2
Aug. 6.9	3.59 .25	63.6 0.9	7.60 .25	46.7 0.6	23.11 .60	10.4 1.6	7.78 .25	7.0 0.2
16.9	3.85 .26	64.4 0.8	7.86 .27	47.3 0.5	23.74 .66	9.0 1.3	8.04 .27	7.1 0.1
26.8	4.12 .27	65.2 0.7	8.13 .28	47.7 0.4	24.43 .70	7.9 1.0	8.32 .29	7.3 0.1
Sept. 5.8	4.40 +.28	65.8 +0.5	8.42 +.29	48.1 +0.3	25.15 +.74	7.0 −0.6	8.62 +.30	7.4 +0.1
15.8	4.68 .29	66.1 +0.2	8.71 .29	48.4 +0.2	25.90 .76	6.6 −0.3	8.92 .31	7.4 0.0
25.8	4.97 .28	66.3 0.0	9.01 .30	48.4 0.0	26.66 .77	6.5 +0.1	9.23 .32	7.3 −0.1
Oct. 5.7	5.25 .28	66.2 −0.2	9.30 .29	48.4 −0.1	27.43 .76	6.7 0.4	9.54 .31	7.2 0.2
15.7	5.53 .27	65.9 0.4	9.60 .29	48.1 0.3	28.19 .75	7.3 0.8	9.85 .31	7.0 0.2
25.7	5.80 +.26	65.4 −0.6	9.88 +.28	47.8 −0.4	28.93 +.72	8.3 +1.2	10.16 +.30	6.8 −0.2
Nov. 4.7	6.06 .25	64.7 0.7	10.16 .27	47.3 0.5	29.62 .67	9.7 1.5	10.46 .29	6.5 0.3
14.6	6.30 .23	63.9 0.9	10.41 .25	46.8 0.6	30.26 .61	11.4 1.8	10.74 .27	6.2 0.3
24.6	6.52 .20	62.9 0.9	10.65 .22	46.2 0.6	30.83 .53	13.3 2.1	11.00 .24	6.0 0.2
Dec. 4.6	6.70 .17	62.0 1.0	10.85 .19	45.6 0.6	31.32 .43	15.6 2.4	11.22 .21	5.7 0.2
14.5	6.85 +.13	61.0 −0.9	11.02 +.15	45.1 −0.5	31.70 +.33	18.1 +2.6	11.42 +.17	5.6 −0.1
24.5	6.96 .09	60.1 0.9	11.15 .11	44.6 0.5	31.97 .21	20.7 2.7	11.57 .13	5.6 0.0
34.5	7.03 +.05	59.3 −0.8	11.23 +.06	44.2 −0.4	32.12 +.08	23.4 +2.7	11.67 +.08	5.6 0.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Argus. (*Canopus.*)		γ Geminorum.		α Canis Majoris. (*Sirius.*)		ε Canis Majoris.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 6 21	° ′ −52 37	h m 6 31	° ′ +16 29	h m 6 40	° ′ −16 33	h m 6 54	° ′ −28 49
	s	″	s	″	s	″	s	″
(Dec. 30.5)	28.78 +.02	73.1 −3.5	11.86 +.11	32.0 −0.4	11.17 +.09	52.8 −2.4	12.35 +.09	16.4 −2.9
Jan. 9.5	28.76 −.06	76.5 3.3	11.94 .06	31.6 0.3	11.24 +.04	55.1 2.2	12.41 +.04	19.2 2.8
19.4	28.66 .13	79.6 3.0	11.97 +.01	31.4 0.2	11.25 −.01	57.2 2.0	12.43 −.01	21.9 2.6
29.4	28.50 .19	82.5 2.7	11.96 −.04	31.2 −0.1	11.22 .06	59.1 1.8	12.39 .07	24.4 2.3
Feb. 8.4	28.28 .25	84.9 2.2	11.89 .09	31.2 0.0	11.14 .10	60.7 1.5	12.30 .11	26.5 2.0
18.4	28.00 −.30	87.0 −1.8	11.78 −.13	31.2 +0.1	11.01 −.14	62.1 −1.2	12.16 −.15	28.3 −1.6
28.3	27.68 .33	88.5 1.3	11.64 .16	31.3 0.1	10.86 .17	63.1 0.9	11.99 .19	29.8 1.3
Mar. 10.3	27.34 .35	89.5 0.8	11.47 .18	31.4 0.1	10.68 .19	63.7 0.5	11.79 .21	30.8 0.8
20.3	26.98 .36	90.0 −0.3	11.29 .19	31.5 0.1	10.48 .20	64.2 −0.2	11.57 .22	31.4 −0.4
30.3	26.61 .36	90.0 +0.3	11.10 .18	31.7 0.1	10.28 .20	64.2 +0.1	11.34 .23	31.6 0.0
Apr. 9.2	26.26 −.34	89.5 +0.8	10.92 −.17	31.8 +0.2	10.09 −.19	64.0 +0.4	11.12 −.22	31.5 +0.4
19.2	25.92 .32	88.4 1.3	10.75 .15	32.0 0.2	9.91 .17	63.4 0.7	10.91 .20	30.9 0.8
29.2	25.62 .28	86.9 1.7	10.61 .12	32.2 0.2	9.75 .15	62.5 1.0	10.72 .18	29.9 1.2
May 9.2	25.36 .24	85.0 2.2	10.51 .09	32.4 0.2	9.61 .11	61.3 1.3	10.55 .15	28.5 1.5
19.1	25.15 .18	82.6 2.5	10.44 .05	32.6 0.2	9.52 .08	59.9 1.5	10.42 .11	26.9 1.8
29.1	25.00 −.13	79.9 +2.8	10.40 −.01	32.8 +0.3	9.46 −.04	58.2 +1.7	10.33 −.07	24.9 +2.1
June 8.1	24.90 .07	77.0 3.1	10.41 +.03	33.1 0.3	9.44 .00	56.4 1.9	10.27 −.03	22.7 2.3
18.0	24.86 −.01	73.8 3.2	10.47 .07	33.5 0.4	9.45 +.04	54.4 2.0	10.26 +.01	20.2 2.5
28.0	24.88 +.05	70.5 3.3	10.56 .11	33.9 0.4	9.51 .08	52.3 2.1	10.29 .05	17.7 2.6
July 8.0	24.96 .11	67.2 3.3	10.69 .15	34.3 0.4	9.60 .11	50.2 2.1	10.36 .09	15.1 2.6
18.0	25.11 +.17	63.9 +3.2	10.85 +.18	34.7 +0.4	9.73 +.14	48.0 +2.1	10.47 +.13	12.4 +2.6
27.9	25.30 .22	60.8 3.0	11.04 .21	35.2 0.4	9.89 .17	46.0 2.0	10.62 .16	9.9 2.5
Aug. 6.9	25.55 .27	57.9 2.7	11.26 .23	35.6 0.4	10.08 .20	44.1 1.8	10.79 .19	7.5 2.3
16.9	25.84 .31	55.4 2.3	11.50 .25	35.9 0.3	10.30 .23	42.4 1.5	11.00 .22	5.3 2.0
26.8	26.17 .35	53.3 1.9	11.76 .27	36.2 0.2	10.53 .25	41.1 1.2	11.24 .25	3.5 1.6
Sept. 5.8	26.53 +.37	51.7 +1.3	12.04 +.28	36.3 +0.1	10.79 +.26	40.0 +0.8	11.50 +.27	2.1 +1.2
15.8	26.92 .39	50.7 0.7	12.32 .29	36.4 0.0	11.06 .27	39.4 +0.4	11.77 .28	1.1 0.7
25.8	27.32 .40	50.3 +0.1	12.62 .30	36.3 −0.2	11.34 .28	39.1 0.0	12.07 .30	0.7 +0.2
Oct. 5.7	27.73 .40	50.5 −0.5	12.92 .30	36.0 0.3	11.62 .29	39.4 −0.4	12.37 .31	0.7 −0.2
15.7	28.13 .39	51.4 1.2	13.22 .30	35.7 0.4	11.91 .29	40.0 0.9	12.68 .31	1.3 0.8
25.7	28.51 +.37	52.9 −1.8	13.52 +.30	35.2 −0.5	12.20 +.28	41.1 −1.3	12.99 +.30	2.4 −1.4
Nov. 4.7	28.87 .34	54.9 2.3	13.81 .29	34.6 0.6	12.48 .27	42.6 1.6	13.29 .29	4.0 1.8
14.6	29.20 .30	57.5 2.8	14.09 .27	34.0 0.6	12.74 .25	44.4 1.9	13.57 .27	6.1 2.2
24.6	29.47 .25	60.5 3.1	14.35 .25	33.4 0.6	12.99 .23	46.5 2.2	13.83 .25	8.5 2.5
Dec. 4.6	29.70 .19	63.7 3.3	14.59 .22	32.8 0.6	13.20 .20	48.8 2.3	14.06 .21	11.1 2.8
14.5	29.86 +.13	67.1 −3.5	14.79 +.18	32.2 −0.5	13.38 +.16	51.2 −2.4	14.26 +.17	14.0 −2.9
24.5	29.95 +.06	70.6 3.5	14.95 .14	31.7 0.5	13.52 .12	53.6 2.4	14.41 .12	16.9 2.9
34.5	29.98 −.02	74.1 −3.4	15.06 +.09	31.3 −0.4	13.62 +.07	55.9 −2.3	14.51 +.08	19.8 −2.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Canis Majoris.		δ Geminorum.		Piazzi vii. 67.		α² Geminorum. (*Castor.*)	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 7 3	° ′ −26 12	h m 7 13	° ′ +22 11	h m 7 19	° ′ +68 41	h m 7 27	° ′ +32 7
	s	″	s	″	s	″	s	″
(Dec.30.5)	48.98 +.10	59.0 −2.8	23.24 +.15	12.4 −0.2	9.23 +.32	30.7 +2.4	24.21 +.18	57.4 +0.4
Jan. 9.5	49.06 +.05	61.8 2.7	23.37 .10	12.2 0.0	9.49 .19	33.2 2.6	24.37 .13	57.9 0.5
19.5	49.08 .00	64.4 2.5	23.44 +.05	12.3 +0.1	9.62 +.07	35.8 2.6	24.46 .07	58.5 0.7
29.5	49.06 −.05	66.8 2.3	23.47 .00	12.4 0.2	9.62 −.06	38.5 2.6	24.51 +.01	59.3 0.8
Feb. 8.4	48.98 .10	68.9 2.0	23.44 −.05	12.7 0.3	9.50 .18	41.0 2.4	24.49 −.05	60.1 0.8
18.4	48.86 −.14	70.7 −1.6	23.36 −.10	13.1 +0.4	9.25 −.29	43.4 +2.2	24.41 −.10	61.0 +0.9
28.4	48.70 .17	72.2 1.2	23.24 .14	13.4 0.4	8.91 .38	45.4 1.9	24.29 .14	61.8 0.8
Mar. 10.3	48.52 .20	73.2 0.9	23.09 .16	13.8 0.4	8.49 .45	47.1 1.5	24.14 .17	62.6 0.7
20.3	48.31 .21	73.9 0.5	22.91 .18	14.2 0.4	8.00 .50	48.4 1.0	23.95 .19	63.3 0.6
30.3	48.09 .22	74.1 −0.1	22.72 .19	14.6 0.3	7.48 .52	49.2 0.6	23.75 .20	63.8 0.5
Apr. 9.3	47.88 −.21	74.0 +0.3	22.53 −.18	14.9 +0.3	6.95 −.52	49.5 +0.1	23.54 −.20	64.2 +0.3
19.2	47.67 .20	73.5 0.7	22.36 .17	15.1 0.2	6.44 .49	49.3 −0.4	23.34 .19	64.5 +0.1
29.2	47.48 .17	72.7 1.0	22.20 .15	15.3 0.1	5.97 .45	48.7 0.9	23.16 .17	64.5 0.0
May 9.2	47.32 .15	71.4 1.4	22.06 .12	15.4 +0.1	5.55 .38	47.6 1.3	23.01 .14	64.4 −0.2
19.1	47.19 .11	69.9 1.7	21.96 .08	15.4 0.0	5.20 .30	46.1 1.6	22.89 .10	64.2 0.3
29.1	47.10 −.08	68.0 +2.0	21.90 −.04	15.5 0.0	4.94 −.21	44.3 −1.9	22.81 −.06	63.8 −0.4
June 8.1	47.04 −.04	65.9 2.2	21.87 −.01	15.5 0.0	4.78 .11	42.2 2.2	22.76 −.02	63.4 0.5
18.1	47.02 .00	63.7 2.4	21.89 +.03	15.5 0.0	4.71 −.01	39.9 2.4	22.76 +.02	62.9 0.6
28.0	47.05 +.04	61.2 2.5	21.94 .07	15.4 0.0	4.75 +.09	37.5 2.5	22.81 .06	62.3 0.6
July 8.0	47.11 .08	58.7 2.5	22.04 .11	15.4 0.0	4.88 .18	35.0 2.5	22.89 .10	61.6 0.7
18.0	47.21 +.12	56.2 +2.5	22.16 +.14	15.4 −0.1	5.11 +.28	32.5 −2.5	23.02 +.14	60.9 −0.7
28.0	47.35 .15	53.8 2.4	22.33 .17	15.3 0.1	5.44 .36	30.0 2.4	23.17 .18	60.2 0.7
Aug. 6.9	47.51 .18	51.5 2.2	22.52 .20	15.2 0.1	5.85 .44	27.7 2.3	23.37 .21	59.5 0.7
16.9	47.71 .21	49.4 1.9	22.73 .23	15.1 0.2	6.33 .52	25.4 2.1	23.59 .24	58.8 0.8
26.9	47.94 .24	47.6 1.6	22.97 .25	14.9 0.2	6.87 .58	23.4 1.9	23.84 .26	58.0 0.7
Sept. 5.9	48.19 +.26	46.2 +1.2	23.23 +.27	14.6 −0.3	7.48 +.63	21.6 −1.6	24.11 +.28	57.3 −0.7
15.8	48.45 .28	45.3 0.7	23.51 .29	14.2 0.4	8.14 .68	20.1 1.4	24.41 .30	56.5 0.8
25.8	48.74 .29	44.8 +0.2	23.81 .30	13.8 0.5	8.85 .72	18.9 1.0	24.73 .32	55.8 0.8
Oct. 5.8	49.04 .30	44.8 −0.3	24.12 .31	13.3 0.6	9.58 .74	18.0 0.7	25.06 .34	55.0 0.7
15.7	49.34 .30	45.4 0.8	24.43 .32	12.6 0.6	10.33 .75	17.5 −0.3	25.40 .35	54.3 0.7
25.7	49.65 +.30	46.4 −1.3	24.75 +.32	12.0 −0.7	11.09 +.75	17.4 +0.1	25.75 +.35	53.6 −0.6
Nov. 4.7.	49.95 .29	47.9 1.7	25.07 .32	11.3 0.7	11.83 .74	17.6 0.5	26.10 .35	53.0 0.5
14.7	50.23 .28	49.9 2.1	25.38 .31	10.6 0.7	12.56 .70	18.3 0.9	26.44 .34	52.6 0.4
24.6	50.50 .25	52.2 2.4	25.68 .29	10.0 0.6	13.24 .65	19.4 1.3	26.78 .32	52.2 0.3
Dec. 4.6	50.74 .22	54.8 2.6	25.96 .26	9.4 0.5	13.86 .58	20.9 1.7	27.09 .30	52.0 −0.1
14.6	50.94 +.18	57.5 −2.8	26.21 +.23	9.0 −0.4	14.41 +.50	22.8 +2.0	27.37 +.26	52.0 +0.1
24.6	51.10 .14	60.3 2.8	26.41 .19	8.6 0.3	14.86 .39	24.9 2.3	27.61 .22	52.2 0.2
34.5	51.21 +.09	63.1 −2.8	26.58 +.14	8.5 −0.1	15.19 +.27	27.3 +2.5	27.80 +.17	52.6 +0.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Canis Minoris. (*Procyon.*)		β Geminorum. (*Pollux.*)		φ Geminorum.		3 Ursæ Majoris (H.)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 7 33	° ′ + 5 30	h m 7 38	° ′ +28 17	h m 7 46	° ′ +27 3	h m 8 1	° ′ +68 47
	s	″	s	″	s	″	s	″
(Dec. 30.5)	23.98 +.15	42.3 -1.3	24.80 +.19	43.4 +0.1	35.60 +.19	16.6 -0.1	35.44 +.42	65.8 +2.1
Jan. 9.5	24.11 .11	41.1 1.2	24.96 .13	43.6 0.3	35.77 .14	16.7 +0.2	35.80 .30	68.1 2.4
19.5	24.20 .06	40.0 1.0	25.07 .08	43.9 0.4	35.88 .09	16.9 0.3	36.04 .18	70.6 2.6
29.5	24.23 +.01	39.1 0.8	25.12 +.02	44.4 0.6	35.94 +.03	17.3 0.5	36.16 +.05	73.2 2.7
Feb. 8.4	24.22 -.04	38.4 0.6	25.11 -.03	45.1 0.7	35.95 -.02	17.9 0.6	36.14 -.08	75.9 2.6
18.4	24.15 -.08	37.8 -0.4	25.05 -.08	45.8 +0.7	35.90 -.07	18.5 +0.7	36.00 -.20	78.5 +2.5
28.4	24.05 .12	37.5 0.3	24.95 .13	46.5 0.7	35.80 .12	19.2 0.7	35.74 .31	80.9 2.3
Mar. 10.3	23.92 .15	37.3 -0.1	24.80 .16	47.2 0.7	35.66 .15	19.9 0.7	35.39 .39	83.0 1.9
20.3	23.76 .17	37.3 0.0	24.63 .18	47.8 0.6	35.50 .17	20.6 0.6	34.96 .46	84.7 1.5
30.3	23.59 .17	37.3 +0.1	24.44 .19	48.4 0.5	35.31 .19	21.2 0.5	34.48 .50	86.0 1.1
Apr. 9.3	23.41 -.17	37.6 +0.3	24.24 -.19	48.9 +0.4	35.12 -.19	21.6 +0.4	33.96 -.52	86.9 +0.6
19.2	23.24 .16	37.9 0.4	24.05 .18	49.2 0.3	34.93 .18	22.0 0.3	33.44 .51	87.2 +0.1
29.2	23.08 .15	38.3 0.5	23.87 .16	49.3 +0.1	34.76 .16	22.3 0.2	32.94 .48	87.1 -0.4
May 9.2	22.95 .12	38.8 0.5	23.72 .14	49.4 0.0	34.61 .14	22.4 +0.1	32.48 .43	86.5 0.8
19.2	22.84 .09	39.4 0.6	23.60 .11	49.3 -0.1	34.48 .10	22.4 0.0	32.07 .37	85.5 1.3
29.1	22.77 -.06	40.0 +0.7	23.51 -.07	49.2 -0.2	34.39 -.07	22.3 -0.1	31.74 -.29	84.0 -1.6
June 8.1	22.72 -.03	40.8 0.8	23.46 -.03	48.9 0.3	34.34 -.03	22.1 0.2	31.48 .21	82.2 2.0
18.1	22.71 +.01	41.6 0.8	23.45 +.01	48.6 0.4	34.33 .00	21.9 0.3	31.32 .12	80.1 2.2
28.0	22.74 .04	42.4 0.8	23.48 .05	48.2 0.4	34.35 +.04	21.5 0.3	31.25 -.02	77.7 2.4
July 8.0	22.80 .08	43.3 0.8	23.55 .09	47.8 0.5	34.41 .08	21.2 0.4	31.28 +.08	75.2 2.6
18.0	22.90 +.11	44.1 +0.8	23.66 +.13	47.3 -0.5	34.51 +.12	20.8 -0.4	31.40 +.17	72.6 -2.6
28.0	23.03 .14	44.9 0.8	23.80 .16	46.8 0.5	34.65 .15	20.3 0.4	31.62 .26	69.9 2.6
Aug. 6.9	23.18 .17	45.6 0.7	23.98 .19	46.2 0.6	34.81 .18	19.8 0.5	31.92 .34	67.3 2.6
16.9	23.36 .19	46.2 0.5	24.18 .22	45.6 0.6	35.01 .21	19.2 0.5	32.31 .42	64.7 2.5
26.9	23.56 .21	46.7 0.4	24.41 .25	45.0 0.7	35.23 .23	18.6 0.6	32.77 .50	62.3 2.4
Sept. 5.9	23.79 +.23	46.9 +0.2	24.67 +.27	44.3 -0.7	35.47 +.26	17.9 -0.7	33.30 +.56	60.0 -2.2
15.8	24.03 .25	47.0 -0.1	24.94 .29	43.6 0.8	35.74 .28	17.2 0.7	33.89 .62	57.9 1.9
25.8	24.30 .27	46.8 0.3	25.24 .31	42.8 0.8	36.03 .30	16.3 0.8	34.54 .67	56.1 1.7
Oct. 5.8	24.57 .28	46.4 0.6	25.56 .32	42.0 0.8	36.34 .32	15.5 0.8	35.24 .71	54.6 1.3
15.7	24.86 .29	45.7 0.8	25.88 .33	41.2 0.8	36.67 .33	14.6 0.8	35.97 .74	53.4 1.0
25.7	25.16 +.30	44.8 -1.0	26.22 +.34	40.4 -0.8	37.00 +.34	13.8 -0.9	36.72 +.76	52.6 -0.6
Nov. 4.7	25.45 .30	43.6 1.2	26.56 .34	39.7 0.7	37.34 .34	12.9 0.9	37.48 .76	52.3 -0.2
14.7	25.75 .29	42.4 1.4	26.90 .33	38.9 0.6	37.68 .33	12.1 0.8	38.24 .74	52.3 +0.2
24.6	26.03 .28	41.0 1.4	27.22 .32	38.4 0.5	38.00 .32	11.4 0.7	38.97 .71	52.8 0.7
Dec. 4.6	26.30 .25	39.5 1.5	27.53 .29	37.9 0.4	38.31 .30	10.9 0.6	39.66 .66	53.8 1.2
14.6	26.54 +.22	38.0 -1.4	27.81 +.26	37.6 -0.2	38.60 +.26	10.5 -0.5	40.29 +.58	55.2 +1.6
24.6	26.74 .18	36.7 1.3	28.05 .22	37.5 0.0	38.84 .23	10.3 0.3	40.83 .49	57.0 1.9
34.5	26.91 +.14	35.3 -1.2	28.24 +.17	37.6 +0.2	39.05 +.18	10.2 -0.1	41.27 +.38	59.1 +2.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	15 Argus (ι)		η Cancri.		ε Hydræ.		ι Ursæ Majoris.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 8 2	° ′ −23 58	h m 8 26	° ′ +20 49	h m 8 40	° ′ + 6 49	h m 8 51	° ′ +48 28
	s	″	s	″	s	″	s	″
(Dec. 30.6)	45.00 +.17	48.6 −2.8	11.04 +.22	17.9 −0.6	48.12 +.22	50.8 −1.4	28.64 +.33	50.9 +0.8
Jan. 9.5	45.14 .12	51.4 2.8	11.24 .18	17.4 0.4	48.32 .17	49.5 1.3	28.93 .26	51.9 1.1
19.5	45.23 .07	54.1 2.6	11.39 .12	17.1 −0.1	48.47 .13	48.3 1.1	29.16 .20	53.1 1.4
29.5	45.27 +.01	56.7 2.4	11.49 .07	17.1 0.0	48.57 .08	47.4 0.8	29.32 .12	54.7 1.6
Feb. 8.5	45.26 −.04	59.0 2.2	11.54 +.02	17.2 +0.2	48.62 +.03	46.6 0.6	29.41 +.05	56.4 1.8
18.4	45.20 −.08	61.0 −1.9	11.53 −.02	17.6 +0.4	48.62 −.02	46.1 −0.4	29.42 −.02	58.3 +1.9
28.4	45.09 .12	62.7 1.6	11.47 .08	18.0 0.5	48.58 .06	45.8 −0.2	29.37 .09	60.2 1.9
Mar. 10.4	44.95 .16	64.1 1.2	11.37 .12	18.6 0.6	48.49 .10	45.6 0.0	29.25 .14	62.0 1.8
20.4	44.78 .18	65.1 0.9	11.24 .15	19.1 0.6	48.38 .13	45.7 +0.1	29.08 .19	63.7 1.6
30.3	44.59 .19	65.8 0.5	11.08 .16	19.7 0.6	48.24 .15	45.8 0.2	28.87 .22	65.2 1.4
Apr. 9.3	44.39 −.20	66.1 −0.1	10.91 −.17	20.3 +0.6	48.08 −.16	46.1 +0.3	28.63 −.24	66.4 +1.1
19.3	44.19 .19	66.0 +0.2	10.74 .17	20.8 0.5	47.92 .16	46.5 0.4	28.38 .25	67.4 0.8
29.3	44.00 .18	65.6 0.6	10.57 .16	21.3 0.4	47.76 .15	46.9 0.5	28.13 .25	68.0 0.4
May 9.2	43.83 .16	64.9 0.9	10.42 .14	21.7 0.3	47.62 .14	47.5 0.5	27.89 .23	68.2 +0.1
19.2	43.68 .14	63.8 1.2	10.28 .12	22.0 0.3	47.49 .12	48.0 0.6	27.67 .20	68.1 −0.3
29.2	43.55 −.11	62.4 +1.5	10.18 −.09	22.2 +0.2	47.38 −.09	48.7 +0.6	27.48 −.17	67.7 −0.6
June 8.1	43.46 .08	60.7 1.8	10.10 .06	22.4 +0.1	47.30 .07	49.3 0.7	27.33 .13	67.0 0.9
18.1	43.40 .04	58.8 2.0	10.06 −.03	22.5 0.0	47.25 .04	50.0 0.7	27.22 .09	65.9 1.1
28.1	43.37 −.01	56.8 2.1	10.05 +.01	22.5 0.0	47.22 −.01	50.7 0.7	27.16 −.04	64.7 1.4
July 8.1	43.38 +.02	54.6 2.2	10.07 .04	22.4 −0.1	47.23 +.02	51.3 0.6	27.14 .00	63.2 1.6
18.0	43.42 +.06	52.3 +2.3	10.12 +.07	22.3 −0.2	47.26 +.05	52.0 +0.5	27.16 +.05	61.5 −1.7
28.0	43.50 .09	50.0 2.2	10.21 .10	22.1 0.3	47.33 .08	52.5 0.5	27.23 .09	59.7 1.9
Aug. 7.0	43.61 .13	47.9 2.1	10.33 .13	21.8 0.3	47.42 .11	53.0 0.4	27.35 .14	57.8 2.0
17.0	43.76 .16	45.8 1.9	10.48 .16	21.4 0.4	47.54 .13	53.4 0.3	27.51 .18	55.8 2.0
26.9	43.93 .19	44.1 1.6	10.65 .19	20.9 0.6	47.69 .16	53.6 +0.1	27.72 .22	53.7 2.1
Sept. 5.9	44.13 +.22	42.6 +1.3	10.85 +.22	20.3 −0.7	47.86 +.19	53.6 −0.1	27.96 +.26	51.6 −2.0
15.9	44.36 .24	41.5 0.9	11.08 .24	19.5 0.8	48.06 .21	53.5 0.3	28.24 .30	49.6 2.0
25.8	44.62 .27	40.8 +0.5	11.34 .26	18.6 0.9	48.29 .24	53.1 0.5	28.56 .34	47.6 1.9
Oct. 5.8	44.89 .28	40.5 0.0	11.61 .29	17.7 1.0	48.54 .26	52.4 0.7	28.92 .37	45.8 1.8
15.8	45.19 .30	40.8 −0.5	11.91 .31	16.6 1.1	48.81 .28	51.6 1.0	29.30 .40	44.0 1.6
25.8	45.50 +.31	41.6 −1.0	12.22 +.32	15.4 −1.2	49.10 +.30	50.5 −1.2	29.72 +.42	42.5 −1.4
Nov. 4.7	45.81 .31	42.8 1.5	12.55 .33	14.2 1.2	49.41 .31	49.2 1.4	30.15 .44	41.1 1.2
14.7	46.12 .30	44.5 1.9	12 88 .33	13.0 1.2	49.72 .31	47.8 1.5	30.60 .45	40.1 0.9
24.7	46.42 .29	46.6 2.2	13.20 .32	11.8 1.1	50.03 .31	46.2 1.6	31.05 .44	39.3 0.6
Dec. 4.7	46.70 .27	49.0 2.5	13.52 .31	10.7 1.0	50.33 .30	44.6 1.6	31.48 .43	38.9 −0.2
14.6	46.95 +.24	51.6 −2.7	13.82 +.28	9.7 −0.9	50.62 +.27	43.0 −1.6	31.90 +.40	38.9 +0.2
24.6	47.17 .20	54.4 2.8	14.09 .25	9.0 0.7	50.88 .24	41.4 1.5	32.28 .36	39.3 0.5
34.6	47.35 +.15	57.2 −2.8	14.32 +.21	8.4 −0.5	51.11 +.21	40.0 −1.4	32.62 +.30	40.0 +0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ² Ursæ Majoris.		κ Cancri.		ι Argus.		1 Draconis (H.)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 9 0	+67° 35′	h m 9 1	+11° 7′	h m 9 14	−58° 47′	h m 9 20	+81° 48′
	s	″	s	″	s	″	s	″
(Dec.30.6)	27.45 +.50	17.1 +1.6	38.12 +.24	13.4 −1.3	6.24 +.31	56.4 −3.4	57.37 +1.34	71.7 +1.9
Jan. 9.6	27.93 .42	18.9 2.0	38.34 .20	12.2 1.1	6.51 .23	59.9 3.6	58.59 1.10	73.9 2.3
19.6	28.30 .32	21.1 2.3	38.51 .15	11.2 0.9	6.70 .15	63.6 3.7	59.57 .83	76.4 2.7
29.5	28.56 .20	23.5 2.5	38.64 .10	10.5 0.6	6.81 +.07	67.4 3.7	60.26 .54	79.2 2.9
Feb. 8.5	28.69 +.07	26.2 2.7	38.71 +.05	10.0 0.4	6.84 −.01	71.1 3.6	60.64 +.23	82.3 3.1
18.5	28.70 −.05	28.8 +2.7	38.74 .00	9.7 −0.2	6.79 −.09	74.6 −3.4	60.71 −.08	85.4 +3.2
28.4	28.60 .16	31.5 2.6	38.71 −.04	9.6 0.0	6.66 .16	77.9 3.2	60.47 .38	88.5 3.0
Mar. 10.4	28.39 .26	34.0 2.4	38.65 .08	9.6 +0.2	6.46 .23	81.0 2.8	59.95 .66	91.4 2.8
20.4	28.08 .34	36.3 2.1	38.54 .11	9.9 0.3	6.20 .28	83.6 2.5	59.16 .89	94.0 2.4
30.4	27.70 .41	38.2 1.7	38.42 .14	10.2 0.4	5.90 .32	85.9 2.0	58.16 1.08	96.3 2.0
Apr. 9.3	27.27 −.45	39.8 +1.3	38.27 −.15	10.7 +0.5	5.56 −.35	87.7 −1.6	56.99 −1.23	98.1 +1.6
19.3	26.81 .47	40.8 0.8	38.12 .15	11.1 0.5	5.20 .37	89.0 1.1	55.70 1.32	99.4 1.0
29.3	26.33 .47	41.4 +0.4	37.96 .15	11.7 0.5	4.83 .37	89.8 −0.5	54.35 1.36	100.1 +0.5
May 9.3	25.87 .45	41.5 −0.1	37.82 .14	12.2 0.5	4.46 .37	90.1 0.0	52.99 1.34	100.3 −0.1
19.2	25.44 .41	41.2 0.6	37.68 .12	12.8 0.5	4.10 .36	89.9 +0.5	51.67 1.27	99.9 0.7
29.2	25.05 −.36	40.3 −1.0	37.57 −.10	13.3 +0.5	3.75 −.33	89.1 +1.0	50.44 −1.17	98.9 −1.2
June 8.2	24.71 .30	39.1 1.5	37.48 .08	13.8 0.5	3.43 .30	87.9 1.5	49.33 1.03	97.5 1.7
18.1	24.45 .23	37.4 1.8	37.41 .05	14.3 0.5	3.15 .26	86.2 1.9	48.38 .86	95.6 2.1
28.1	24.26 .15	35.4 2.1	37.37 −.02	14.8 0.4	2.90 .22	84.1 2.3	47.61 .66	93.2 2.5
July 8.1	24.16 −.07	33.1 2.4	37.37 +.01	15.2 0.4	2.71 .17	81.7 2.6	47.05 .45	90.6 2.8
18.1	24.13 +.01	30.6 −2.6	37.38 +.03	15.6 +0.3	2.57 −.11	79.0 +2.8	46.70 −.23	87.6 −3.0
28.0	24.19 .10	27.9 2.7	37.43 .06	15.9 0.2	2.48 −.05	76.0 3.0	46.59 .00	84.5 3.2
Aug. 7.0	24.33 .18	25.1 2.8	37.51 .09	16.0 +0.1	2.46 +.01	72.9 3.1	46.70 +.23	81.2 3.3
17.0	24.55 .26	22.2 2.9	37.61 .12	16.1 0.0	2.51 .08	69.9 3.0	47.04 .45	77.8 3.3
27.0	24.85 .34	19.4 2.8	37.74 .15	16.0 −0.2	2.62 .14	66.9 2.9	47.61 .68	74.5 3.3
Sept. 5.9	25.22 +.41	16.6 −2.7	37.90 +.17	15.8 −0.3	2.80 +.21	64.1 +2.7	48.39 +.89	71.2 −3.2
15.9	25.67 .48	13.9 2.6	38.09 .20	15.4 0.5	3.04 .28	61.6 2.3	49.38 1.09	68.1 3.0
25.9	26.18 .54	11.4 2.4	38.30 .23	14.7 0.7	3.35 .34	59.5 1.9	50.56 1.27	65.2 2.8
Oct. 5.8	26.75 .60	9.1 2.1	38.55 .25	13.9 0.9	3.71 .39	57.8 1.3	51.92 1.43	62.6 2.5
15.8	27.38 .65	7.1 1.8	38.81 .28	12.8 1.1	4.13 .43	56.8 0.7	53.42 1.57	60.3 2.1
25.8	28.05 +.69	5.4 −1.5	39.10 +.30	11.6 −1.3	4.58 +.47	56.3 +0.1	55.05 +1.68	58.4 −1.7
Nov. 4.8	28.76 .71	4.1 1.0	39.40 .31	10.2 1.4	5.06 .49	56.6 −0.5	56.78 1.76	56.9 1.2
14.7	29.48 .72	3.3 0.6	39.72 .32	8.7 1.5	5.55 .49	57.4 1.2	58.57 1.79	56.0 0.7
24.7	30.21 .72	2.9 −0.1	40.04 .32	7.2 1.6	6.04 .48	58.9 1.8	60.37 1.79	55.6 −0.1
Dec. 4.7	30.92 .69	3.0 +0.4	40.36 .31	5.6 1.6	6.51 .45	61.0 2.3	62.14 1.73	55.8 +0.5
14.7	31.59 +.64	3.6 +0.8	40.66 +.29	4.0 −1.5	6.94 +.41	63.6 −2.8	63.84 +1.63	56.6 +1.0
24.6	32.21 .58	4.6 1.3	40.94 .26	2.6 1.4	7.32 .35	66.6 3.3	65.40 1.47	57.9 1.6
34.6	32.75 +.50	6.2 +1.8	41.19 +.22	1.3 −1.2	7.64 +.28	70.0 −3.5	66.78 +1.27	59.7 +2.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Hydræ.		*d* Ursæ Majoris.		*θ* Ursæ Majoris.		*ε* Leonis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 9 22	° ′ − 8 10	h m 9 24	° ′ +70 19	h m 9 25	° ′ +52 11	h m 9 39	° ′ +24 17
	s	″	s	″	s	″	s	″
(Dec. 30.6)	2.68 +.24	11.8 −2.2	29.36 +.63	17.8 +1.4	18.05 +.38	15.4 +0.6	26.45 +.29	29.0 −0.8
Jan. 9.6	2.90 .20	14.0 2.1	29.94 .52	19.4 1.9	18.40 .32	16.3 1.0	26.71 .25	28.3 0.5
19.6	3.08 .16	16.1 2.0	30.41 .41	21.5 2.3	18.69 .25	17.6 1.4	26.94 .20	28.0 −0.2
29.5	3.22 .11	18.0 1.8	30.75 .28	24.0 2.6	18.91 .18	19.1 1.7	27.12 .15	27.9 +0.1
Feb. 8.5	3.30 .06	19.7 1.6	30.97 .14	26.6 2.7	19.05 .10	21.0 1.9	27.24 .10	28.1 0.3
18.5	3.34 +.01	21.2 −1.4	31.04 +.01	29.5 +2.8	19.11 +.02	23.0 +2.1	27.31 +.04	28.6 +0.6
28.4	3.32 −.03	22.5 1.1	30.98 −.12	32.3 2.7	19.10 −.05	25.1 2.1	27.33 −.01	29.3 0.7
Mar. 10.4	3.27 .07	23.4 0.9	30.79 .24	35.0 2.6	19.01 .12	27.3 2.1	27.29 .05	30.1 0.9
20.4	3.18 .10	24.1 0.6	30.50 .34	37.5 2.4	18.87 .17	29.3 1.9	27.22 .09	31.0 0.9
30.4	3.06 .13	24.6 0.4	30.11 .42	39.7 2.0	18.67 .22	31.1 1.7	27.11 .13	32.0 1.0
Apr. 9.3	2.92 −.14	24.9 −0.1	29.65 −.48	41.5 +1.6	18.43 −.25	32.7 +1.4	26.97 −.14	32.9 +0.9
19.3	2.78 .15	24.9 +0.1	29.14 .52	42.9 1.1	18.18 .26	34.0 1.1	26.82 .15	33.8 0.9
29.3	2.63 .15	24.7 0.3	28.61 .53	43.7 0.6	17.91 .27	34.9 0.7	26.67 .16	34.7 0.8
May 9.3	2.48 .14	24.2 0.5	28.07 .52	44.1 +0.1	17.64 .26	35.4 +0.3	26.51 .15	35.4 0.6
19.2	2.34 .13	23.7 0.7	27.56 .50	44.0 −0.4	17.39 .24	35.6 0.0	26.36 .14	35.9 0.5
29.2	2.21 −.11	22.9 +0.9	27.08 −.45	43.3 −0.9	17.16 −.21	35.4 −0.4	26.23 −.12	36.4 +0.4
June 8.2	2.11 .09	22.0 1.0	26.66 .39	42.2 1.3	16.96 .18	34.8 0.8	26.11 .10	36.6 +0.2
18.1	2.03 .07	20.9 1.1	26.31 .32	40.7 1.7	16.80 .14	33.8 1.1	26.02 .08	36.8 0.0
28.1	1.98 .04	19.7 1.2	26.03 .24	38.7 2.1	16.68 .10	32.5 1.4	25.95 .06	36.7 −0.1
July 8.1	1.94 −.03	18.5 1.3	25.83 .15	36.5 2.4	16.61 −.05	31.0 1.7	25.91 −.03	36.5 0.2
18.1	1.92 .00	17.2 +1.3	25.73 −.06	33.9 −2.7	16.58 .00	29.2 −1.9	25.90 .00	36.2 −0.4
28.0	1.94 +.03	15.9 1.3	25.71 +.03	31.2 2.9	16.60 +.04	27.2 2.1	25.91 +.03	35.7 0.6
Aug. 7.0	1.98 .06	14.7 1.2	25.79 .12	28.2 3.0	16.67 .09	25.1 2.2	25.96 .06	35.1 0.7
17.0	2.05 .09	13.5 1.1	25.96 .22	25.2 3.0	16.78 .14	22.8 2.3	26.03 .09	34.3 0.9
27.0	2.15 .12	12.6 0.9	26.22 .31	22.2 3.0	16.94 .18	20.4 2.4	26.13 .12	33.3 1.0
Sept. 5.9	2.29 +.15	11.8 +0.6	26.57 +.39	19.1 −3.0	17.15 +.23	18.0 −2.4	26.27 +.15	32.2 −1.2
15.9	2.45 .18	11.3 0.4	27.00 .47	16.2 2.9	17.40 .28	15.5 2.4	26.43 .18	31.0 1.3
25.9	2.64 .21	11.0 +0.1	27.52 .55	13.4 2.7	17.70 .32	13.1 2.3	26.63 .21	29.6 1.5
Oct. 5.8	2.86 .23	11.2 −0.3	28.11 .63	10.8 2.5	18.04 .36	10.8 2.2	26.86 .25	28.1 1.6
15.8	3.11 .26	11.6 0.6	28.77 .69	8.5 2.2	18.42 .40	8.6 2.1	27.12 .28	26.5 1.6
25.8	3.38 +.28	12.4 −1.0	29.49 +.74	6.5 −1.8	18.84 +.43	6.6 −1.9	27.41 +.30	24.8 −1.7
Nov. 4.8	3.68 .30	13.6 1.3	30.26 .78	4.8 1.4	19.28 .46	4.9 1.6	27.73 .32	23.1 1.7
14.7	3.98 .31	15.1 1.6	31.05 .80	3.7 0.9	19.75 .47	3.5 1.3	28.06 .34	21.4 1.7
24.7	4.30 .31	16.9 1.9	31.86 .81	3.0 −0.4	20.23 .48	2.4 0.9	28.41 .35	19.7 1.6
Dec. 4.7	4.61 .31	18.8 2.1	32.67 .79	2.8 +0.1	20.70 .47	1.7 0.5	28.75 .34	18.2 1.4
14.7	4.91 +.29	21.0 −2.2	33.44 +.75	3.2 +0.6	21.17 +.45	1.4 −0.1	29.09 +.33	16.9 −1.2
24.6	5.19 .26	23.2 2.2	34.16 .68	4.1 1.1	21.60 .41	1.6 +0.4	29.42 .31	15.8 1.0
34.6	5.44 +.23	25.4 −2.2	34.81 +.59	5.5 +1.6	21.99 +.37	2.2 +0.8	29.71 +.28	15.0 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	μ Leonis.		α Leonis. (*Regulus.*)		32 Ursæ Majoris.		γ¹ Leonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$9^{h}\ 46^{m}$	$+26^{\circ}\ 31'$	$10^{h}\ 2^{m}$	$+12^{\circ}\ 30'$	$10^{h}\ 9^{m}$	$+65^{\circ}\ 39'$	$10^{h}\ 13^{m}$	$+20^{\circ}\ 24'$
	s	″	s	″	s	″	s	″
(Dec.30.6)	20.39 +.30	69.4 −0.8	21.45 +.28	62.6 −1.5	49.29 +.59	60.5 +0.7	44.63 +.30	38.0 −1.2
Jan. 9.6	20.67 .26	68.8 0.4	21.72 .25	61.3 1.2	49.84 .52	61.5 1.2	44.92 .27	37.0 0.9
19.6	20.90 .21	68.5 −0.1	21.95 .21	60.1 1.0	50.32 .43	63.0 1.7	45.17 .23	36.2 0.6
29.6	21.09 .16	68.5 +0.2	22.13 .16	59.3 0.7	50.71 .34	65.0 2.1	45.37 .18	35.8 −0.3
Feb. 8.5	21.22 .10	68.9 0.5	22.27 .11	58.7 0.4	50.99 .23	67.3 2.4	45.53 .13	35.6 0.0
18.5	21.30 +.05	69.5 +0.7	22.35 +.06	58.4 −0.2	51.17 +.12	69.8 +2.6	45.63 +.08	35.8 +0.3
28.5	21.32 .00	70.3 0.9	22.39 +.01	58.4 0.0	51.23 +.01	72.5 2.7	45.68 +.03	36.2 0.5
Mar. 10.5	21.30 −.05	71.2 1.0	22.38 −.03	58.5 +0.2	51.19 −.09	75.3 2.7	45.69 −.02	36.8 0.7
20.4	21.23 .09	72.3 1.1	22.33 .07	58.9 0.4	51.04 .19	78.0 2.6	45.65 .06	37.6 0.8
30.4	21.12 .12	73.3 1.1	22.25 .10	59.3 0.5	50.81 .27	80.4 2.3	45.57 .09	38.5 0.9
Apr. 9.4	20.99 −.14	74.4 +1.0	22.14 −.12	59.9 +0.6	50.51 −.33	82.6 +2.0	45.47 −.11	39.4 +0.9
19.3	20.83 .16	75.4 0.9	22.01 .13	60.6 0.7	50.16 .37	84.5 1.4	45.34 .13	40.4 0.9
29.3	20.67 .16	76.3 0.6	21.87 .14	61.2 0.7	49.76 .40	85.9 1.2	45.21 .14	41.3 0.9
May 9.3	20.52 .15	77.1 0.7	21.74 .14	61.9 0.7	49.35 .41	86.9 0.7	45.07 .14	42.1 0.8
19.3	20.36 .14	77.6 0.5	21.60 .13	62.6 0.6	48.94 .40	87.3 +0.2	44.93 .13	42.8 0.7
29.2	20.23 −.13	78.1 +0.3	21.48 −.12	63.2 +0.6	48.54 −.38	87.3 −0.2	44.80 −.12	43.4 +0.5
June 8.2	20.11 .11	78.3 +0.2	21.37 .11	63.8 0.5	48.17 .35	86.9 0.7	44.68 .11	43.9 0.4
18.2	20.01 .09	78.4 0.0	21.27 .09	64.3 0.5	47.84 .31	85.9 1.2	44.57 .09	44.2 0.3
28.2	19.93 .06	78.3 −0.2	21.20 .07	64.7 0.4	47.56 .26	84.5 1.6	44.49 .07	44.4 +0.1
July 8.1	19.88 .03	78.0 0.4	21.14 .04	65.0 0.3	47.33 .20	82.7 2.0	44.43 .05	44.4 0.0
18.1	19.86 −.01	77.5 −0.5	21.11 −.02	65.3 +0.2	47.16 −.13	80.5 −2.3	44.39 −.03	44.3 −0.2
28.1	19.87 +.02	76.9 0.7	21.10 .00	65.4 +0.1	47.06 −.07	78.1 2.6	44.37 .00	44.0 0.4
Aug. 7.0	19.91 .05	76.1 0.9	21.12 +.03	65.4 −0.1	47.03 .00	75.4 2.8	44.38 +.02	43.6 0.5
17.0	19.97 .08	75.2 1.0	21.16 .06	65.3 0.2	47.06 +.07	72.5 3.0	44.41 .05	43.0 0.7
27.0	20.07 .11	74.1 1.2	21.24 .09	65.0 0.4	47.17 .15	69.5 3.1	44.48 .08	42.2 0.9
Sept. 6.0	20.20 +.15	72.8 −1.3	21.34 +.12	64.5 −0.6	47.36 +.22	66.4 −3.1	44.57 +.11	41.2 −1.1
15.9	20.37 .18	71.4 1.5	21.47 .15	63.8 0.8	47.61 .29	63.2 3.1	44.70 .14	40.0 1.2
25.9	20.55 .21	69.9 1.6	21.63 .18	62.9 1.0	47.94 .36	60.1 3.0	44.86 .18	38.7 1.4
Oct. 5.9	20.78 .24	68.3 1.7	21.83 .21	61.9 1.2	48.34 .43	57.1 2.9	45.06 .21	37.2 1.6
15.9	21.04 .27	66.6 1.7	22.06 .24	60.6 1.4	48.80 .50	54.3 2.7	45.28 .24	35.6 1.7
25.8	21.33 +.30	64.8 −1.8	22.32 +.27	59.1 −1.6	49.33 +.56	51.8 −2.4	45.55 +.28	33.8 −1.8
Nov. 4.8	21.65 .33	63.0 1.8	22.60 .30	57.5 1.7	49.92 .61	49.5 2.1	45.84 .31	32.0 1.9
14.8	21.98 .34	61.2 1.7	22.91 .32	55.7 1.8	50.55 .64	47.6 1.7	46.15 .32	30.1 1.9
24.7	22.33 .35	59.6 1.6	23.23 .33	53.9 1.8	51.20 .67	46.2 1.2	46.48 .33	28.2 1.8
Dec. 4.7	22.68 .35	58.1 1.4	23.56 .33	52.1 1.8	51.88 .67	45.2 0.7	46.83 .34	26.4 1.7
14.7	23.03 +.34	56.8 −1.1	23.89 +.32	50.3 −1.7	52.55 +.66	44.8 −0.1	47.17 +.34	24.7 −1.6
24.7	23.36 .32	55.7 1.0	24.20 .30	48.7 1.6	53.19 .62	44.9 +0.4	47.50 .32	23.3 1.3
34.6	23.67 +.28	54.9 −0.9	24.49 +.27	47.2 −1.4	53.79 +.57	45.6 +0.9	47.81 +.29	22.0 −1.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	9 Draconis (H.)		ρ Leonis.		η Argus.		*l* Leonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 10 25	+76° 17′	h m 10 26	+ 9° 52′	h m 10 40	−59° 5′	h m 10 43	+11° 8′
	s	″	s	″	s	″	s	″
(Dec.30.6)	28.53 +.98	22.8 +0.9	51.81 +.29	71.1 −1.7	42.44 +.44	11.3 −2.8	19.09 +.31	29.8 −1.7
Jan. 9.6	29.46 .87	24.0 1.5	52.09 .26	69.6 1.4	42.85 .38	14.2 3.1	19.39 .27	28.2 1.4
19.6	30.28 .74	25.7 2.0	52.34 .22	68.2 1.2	43.21 .32	17.5 3.4	19.64 .24	26.9 1.2
29.6	30.95 .59	28.0 2.4	52.54 .18	67.2 0.9	43.49 .24	21.0 3.6	19.86 .20	25.8 0.9
Feb. 8.5	31.45 .41	30.5 2.7	52.70 .13	66.4 0.7	43.69 .17	24.7 3.7	20.04 .15	25.1 0.6
18.5	31.77 +.23	33.4 +2.9	52.81 +.09	65.9 −0.4	43.82 +.09	28.4 −3.6	20.16 +.10	24.6 −0.3
28.5	31.91 +.05	36.4 3.0	52.87 +.04	65.6 −0.1	43.87 +.01	32.0 3.5	20.24 .06	24.4 −0.1
Mar. 10.5	31.86 −.14	39.4 3.0	52.89 .00	65.6 +0.1	43.84 −.06	35.5 3.4	20.27 +.01	24.4 +0.2
20.4	31.64 .30	42.4 2.8	52.86 −.04	65.8 0.3	43.75 .12	38.7 3.1	20.27 −.03	24.7 0.4
30.4	31.26 .45	45.1 2.6	52.80 .07	66.1 0.4	43.59 .18	41.7 2.8	20.22 .06	25.1 0.5
Apr. 9.4	30.74 −.58	47.5 +2.3	52.71 −.10	66.6 +0.5	43.39 −.23	44.3 −2.4	20.14 −.09	25.7 +0.6
19.4	30.12 .66	49.6 1.8	52.60 .11	67.2 0.6	43.14 .27	46.6 2.0	20.05 .11	26.4 0 7
29.3	29.42 .73	51.2 1.3	52.48 .12	67.9 0.7	42.86 .29	48.4 1.6	19.93 .12	27.1 0.7
May 9.3	28.67 .76	52.2 0.8	52.35 .13	68.6 0.7	42.55 .32	49.8 1.1	19.81 .12	27.8 0.7
19.3	27.90 .77	52.8 +0.3	52.23 .13	69.2 0.7	42.22 .33	50.7 0.6	19.69 .12	28.6 0.7
29.3	27.14 −.75	52.7 −0.3	52.10 −.12	69.9 +0.7	41.89 −.33	51.0 −0.1	19.57 −.12	29.3 +0.7
June 8.2	26.41 .70	52.2 0.8	51.99 .11	70.6 0.6	41.56 .33	50.9 +0.4	19.45 .11	29.9 0.6
18.2	25.74 .64	51.1 1.3	51.89 .09	71.1 0.6	41.24 .31	50.3 0.9	19.35 .10	30.5 0.5
28.2	25.14 .55	49.5 1.8	51.80 .08	71.7 0.5	40.93 .29	49.2 1.3	19.25 .08	31.0 0.5
July 8.1	24.63 .46	47.5 2.2	51.74 .06	72.1 0.4	40.65 .27	47.6 1.8	19.18 .07	31.4 0.4
18.1	24.22 −.35	45.1 −2.6	51.69 −.04	72.5 +0.3	40.40 −.23	45.7 +2.1	19.12 −.05	31.7 +0.2
28.1	23.93 .23	42.4 2.9	51.66 −.02	72.7 0.2	40.20 .18	43.4 2.4	19.07 .03	31.9 +0.1
Aug. 7.1	23.76 −.11	39.3 3.1	51.65 +.01	72.9 +0.1	40.04 .13	40.8 2.7	19.05 −.01	32.0 0.0
17.0	23.71 +.02	36.1 3.3	51.67 .03	72.8 −0.1	39.93 .07	38.0 2.8	19.06 +.02	31.9 −0.2
27.0	23.79 .15	32.7 3.4	51.72 .06	72.7 0.3	39.89 −.01	35.1 2.9	19.09 .04	31.6 0.4
Sept. 6.0	24.00 +.28	29.3 −3.5	51.79 +.09	72.3 −0.5	39.92 +.06	32.2 +2.8	19.15 +.07	31.1 −0.6
16.0	24.34 .41	25.8 3.4	51.90 .12	71.7 0.7	40.02 .14	29.4 2.7	19.24 .11	30.5 0.8
25.9	24.82 .53	22.4 3.3	52.04 .16	71.0 0.9	40.19 .21	26.8 2.4	19.36 .14	29.6 1.0
Oct. 5.9	25.41 .66	19.2 3.2	52.21 .19	69.9 1.1	40.43 .28	24.6 2.0	19.52 .18	28.5 1.2
15.9	26.13 .77	16.1 2.9	52.42 .23	68.7 1.3	40.75 .35	22.8 1.6	19.72 .21	27.2 1.4
25.8	26.96 +.87	13.4 −2.6	52.66 +.26	67.3 −1.5	41.13 +.41	21.5 +1.1	19.95 +.25	25.6 −1.6
Nov. 4.8	27.88 .96	11.0 2.4	52.94 .28	65.6 1.7	41.56 .46	20.7 +0.5	20.21 .28	23.9 1.8
14.8	28.88 1.03	9.0 1.7	53.23 .30	63.8 1.8	42.04 .49	20.5 −0.2	20.50 .30	22.0 1.9
24.7	29.94 1.08	7.5 1.2	53.55 .32	61.9 1.9	42.55 .51	21.0 0.8	20.81 .32	20.1 2.0
Dec. 4.7	31.04 1.09	6.6 0.7	53.88 .33	60.0 1.9	43.06 .51	22.1 1.4	21.14 .33	18.1 2.0
14.7	32.13 +1.08	6.2 −0.1	54.21 +.32	58.1 −1.9	43.57 +.50	23.8 −2.0	21.47 +.33	16.1 −1.9
24.7	33.20 1.03	6.4 +0.5	54.52 .30	56.3 1.8	44.05 .46	26.1 2.5	21.80 .32	14.3 1.8
34.6	34.20 + .95	7.3 +1.1	54.82 +.28	54.6 −1.6	44.50 +.42	28.8 −3.0	22.11 +.30	12.6 −1.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α Ursæ Majoris.*		*δ Leonis.*		*δ Crateris.*		*τ Leonis.*	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 10 56	° ′ +62 21	h m 11 8	° ′ +21 8	h m 11 13	° ′ −14 9	h m 11 22	° ′ + 3 28
	s	″	s	″	s	″	s	″
(Dec.30.7)	44.45 +.58	22.8 0.0	5.71 +.33	26.6 −1.5	41.64 +.31	57.4 −2.3	7.44 +.31	41.7 −2.0
Jan. 9.7	45.00 .52	23.2 +0.6	6.03 .30	25.3 1.2	41.94 .28	59.7 2.3	7.75 .29	39.7 1.8
19.6	45.49 .46	24.0 1.1	6.31 .27	24.3 0.8	42.21 .25	62.0 2.3	8.02 .26	38.0 1.7
29.6	45.92 .39	25.4 1.6	6.56 .23	23.7 0.5	42.45 .21	64.3 2.2	8.27 .22	36.4 1.4
Feb. 8.6	46.26 .30	27.3 2.0	6.77 .18	23.4 −0.1	42.64 .17	66.4 2.1	8.47 .18	35.2 1.1
18.5	46.51 +.20	29.5 +2.4	6.93 +.14	23.4 +0.2	42.79 +.12	68.4 −1.9	8.63 +.14	34.1 −0.9
28.5	46.67 .11	32.0 2.6	7.04 .08	23.8 0.5	42.89 .08	70.2 1.6	8.74 .09	33.4 0.6
Mar. 10.5	46.73 +.02	34.7 2.7	7.10 +.03	24.4 0.7	42.95 +.04	71.7 1.4	8.81 .05	32.9 0.3
20.5	46.70 −.07	37.4 2.7	7.12 .00	25.3 0.9	42.96 .00	73.0 1.1	8.84 +.01	32.7 −0.1
30.4	46.59 .15	40.1 2.6	7.09 −.04	26.3 1.1	42.94 −.03	74.0 0.9	8.84 −.02	32.7 +0.1
Apr. 9.4	46.40 −.22	42.6 +2.4	7.04 −.07	27.4 +1.1	42.89 −.06	74.7 −0.6	8.80 −.05	32.9 +0.3
19.4	46.15 .27	44.8 2.1	6.95 .09	28.5 1.1	42.82 .08	75.3 0.4	8.73 .07	33.3 0.4
29.3	45.86 .31	46.7 1.7	6.85 .11	29.6 1.1	42.72 .10	75.5 −0.2	8.65 .09	33.8 0.5
May 9.3	45.53 .34	48.2 1.3	6.73 .12	30.7 1.0	42.62 .11	75.6 0.0	8.55 .10	34.4 0.6
19.3	45.19 .35	49.3 0.8	6.60 .13	31.7 0.9	42.50 .12	75.4 +0.3	8.44 .11	35.0 0.7
29.3	44.84 −.34	49.9 +0.4	6.47 −.13	32.5 +0.8	42.38 −.12	75.1 +0.5	8.33 −.12	35.7 +0.7
June 8.2	44.50 .33	50.0 −0.1	6.35 .12	33.2 0.6	42.26 .12	74.5 0.6	8.22 .11	36.4 0.7
18.2	44.18 .31	49.6 0.6	6.23 .11	33.7 0.4	42.14 .11	73.8 0.8	8.11 .10	37.1 0.7
28.2	43.88 .28	48.8 1.1	6.12 .10	34.1 +0.2	42.03 .10	73.0 0.9	8.01 .10	37.8 0.7
July 8.2	43.62 .24	47.5 1.5	6.02 .09	34.2 0.0	41.93 .10	72.0 1.0	7.92 .09	38.4 0.6
18.1	43.41 −.19	45.8 −1.9	5.94 −.07	34.2 −0.2	41.84 −.08	70.9 +1.1	7.83 −.08	39.0 +0.5
28.1	43.23 .14	43.7 2.2	5.88 .05	33.9 0.4	41.76 .07	69.7 1.2	7.77 .06	39.5 0.4
Aug. 7.1	43.12 .09	41.3 2.5	5.84 .03	33.5 0.6	41.71 .05	68.5 1.2	7.71 .04	39.8 0.3
17.0	43.06 −.03	38.7 2.8	5.82 −.01	32.8 0.8	41.67 −.02	67.3 1.2	7.68 −.02	40.2 +0.2
27.0	43.05 +.03	35.7 3.0	5.83 +.02	32.0 1.0	41.66 +.01	66.2 1.0	7.67 .00	40.3 0.0
Sept. 6.0	43.11 +.09	32.6 −3.2	5.86 +.05	30.9 −1.2	41.68 +.04	65.2 +0.9	7.69 +.03	40.2 −0.2
16.0	43.24 .16	29.4 3.3	5.93 .09	29.6 1.4	41.74 .07	64.4 0.7	7.74 .07	40.0 0.4
25.9	43.43 .23	26.2 3.3	6.03 .12	28.1 1.6	41.82 .11	63.9 0.4	7.82 .10	39.5 0.6
Oct. 5.9	43.69 .30	22.9 3.2	6.18 .16	26.4 1.8	41.95 .15	63.6 +0.1	7.94 .14	38.8 0.9
15.9	44.02 .36	19.7 3.1	6.36 .20	24.5 1.9	42.12 .19	63.6 −0.2	8.10 .18	37.8 1.1
25.9	44.42 +.43	16.7 −2.9	6.57 +.21	22.5 −2.1	42.33 +.23	64.0 −0.5	8.30 +.21	36.5 −1.4
Nov. 4.8	44.88 .48	13.9 2.6	6.83 .27	20.4 2.1	42.57 .26	64.7 0.9	8.53 .25	35.0 1.6
14.8	45.39 .53	11.4 2.3	7.12 .30	18.2 2.2	42.85 .29	65.8 1.3	8.80 .28	33.3 1.8
24.8	45.95 .57	9.3 1.9	7.43 .33	16.0 2.1	43.16 .31	67.3 1.6	9.09 .31	31.4 2.0
Dec. 4.7	46.54 .60	7.6 1.4	7.77 .34	13.9 2.0	43.48 .33	69.0 1.9	9.41 .32	29.4 2.1
14.7	47.14 +.60	6.5 −0.9	8.12 +.35	11.9 −1.9	43.81 +.33	71.0 −2.1	9.73 +.33	27.3 −2.1
24.7	47.74 .59	5.9 −0.3	8.46 .34	10.1 1.6	44.14 .32	73.2 2.3	10.06 .32	25.2 2.0
34.7	48.32 +.57	5.8 +0.3	8.79 +.32	8.6 −1.4	44.45 +.30	75.5 −2.4	10.38 +.31	23.2 −2.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	λ Draconis.		υ Leonis.		β Leonis.		γ Ursæ Majoris.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$11^{h}\ 24^{m}$	$+69^{\circ}\ 56'$	$11^{h}\ 31^{m}$	$-0^{\circ}\ 11'$	$11^{h}\ 43^{m}$	$+15^{\circ}\ 11'$	$11^{h}\ 47^{m}$	$+54^{\circ}\ 18'$
	s	″	s	″	s	″	s	″
(Dec. 30.7)	40.19 +.75	59.8 −0.1	9.66 +.32	59.1 −2.1	17.39 +.33	69.3 −1.8	52.28 +.49	68.4 −0.9
Jan. 9.7	40.92 .71	60.1 +0.5	9.97 .29	61.2 2.0	17.71 .31	67.6 1.5	52.76 .46	67.8 −0.3
19.6	41.60 .64	60.9 1.1	10.25 .26	63.1 1.8	18.01 .28	66.2 1.2	53.21 .43	67.8 +0.3
29.6	42.20 .55	62.3 1.6	10.50 .23	64.8 1.6	18.27 .25	65.1 0.9	53.62 .38	68.3 0.8
Feb. 8.6	42.71 .45	64.2 2.1	10.70 .19	66.3 1.4	18.50 .21	64.4 0.6	53.97 .32	69.4 1.3
18.5	43.10 +.33	66.5 +2.5	10.87 +.14	67.5 −1.1	18.69 +.16	64.0 −0.2	54.26 +.25	71.0 +1.8
28.5	43.37 .21	69.2 2.8	11.00 .10	68.5 0.8	18.83 .12	63.9 +0.1	54.47 .18	73.0 2.1
Mar. 10.5	43.51 +.08	72.0 2.9	11.07 .06	69.2 0.6	18.92 .07	64.2 0.4	54.61 .10	75.3 2.4
20.5	43.53 −.04	75.0 3.0	11.11 +.02	69.6 0.3	18.97 +.03	64.6 0.6	54.68 +.03	77.7 2.5
30.4	43.43 .15	77.9 2.9	11.11 −.01	69.8 −0.1	18.99 .00	65.4 0.8	54.68 −.03	80.3 2.6
Apr. 9.4	43.23 −.25	80.7 +2.7	11.08 −.04	69.8 +0.1	18.96 −.04	66.2 +0.9	54.61 −.09	82.9 +2.5
19.4	42.93 .34	83.3 2.4	11.03 .07	69.6 0.3	18.91 .06	67.2 1.0	54.49 .14	85.4 2.4
29.4	42.55 .40	85.5 2.0	10.95 .08	69.3 0.5	18.84 .08	68.2 1.0	54.33 .18	87.6 2.1
May 9.3	42.12 .45	87.3 1.6	10.86 .10	68.8 0.6	18.75 .10	69.2 1.0	54.13 .21	89.6 1.8
19.3	41.65 .48	88.6 1.1	10.76 .10	68.3 0.6	18.64 .11	70.2 1.0	53.90 .23	91.2 1.4
29.3	41.15 −.50	89.4 +0.6	10.65 −.11	67.7 +0.7	18.53 −.11	71.1 +0.9	53.66 −.25	92.4 +1.0
June 8.3	40.65 .49	89.8 0.0	10.54 .11	67.0 0.7	18.41 .12	72.0 0.8	53.40 .25	93.2 0.6
18.2	40.16 .48	89.5 −0.5	10.43 .11	66.3 0.7	18.30 .11	72.7 0.6	53.16 .25	93.6 +0.1
28.2	39.70 .44	88.8 1.0	10.32 .10	65.6 0.7	18.19 .11	73.2 0.5	52.91 .24	93.5 −0.3
July 8.2	39.28 .40	87.6 1.5	10.23 .09	64.9 0.7	18.08 .10	73.6 0.3	52.68 .22	93.0 0.8
18.1	38.90 −.35	85.9 −1.9	10.14 −.08	64.2 +0.6	17.98 −.09	73.9 +0.1	52.47 −.20	92.0 −1.2
28.1	38.58 .29	83.7 2.3	10.06 .07	63.6 0.5	17.90 .08	73.9 0.0	52.28 .17	90.6 1.6
Aug. 7.1	38.32 .22	81.2 2.7	10.00 .05	63.0 0.4	17.83 .06	73.8 −0.2	52.13 .14	88.8 1.9
17.1	38.13 .15	78.4 3.0	9.96 −.03	62.6 0.2	17.78 .04	73.5 0.4	52.01 .10	86.7 2.3
27.0	38.03 −.06	75.3 3.2	9.94 .00	62.3 +0.1	17.75 −.02	73.0 0.6	51.93 .06	84.2 2.6
Sept. 6.0	38.01 +.02	72.0 −3.4	9.95 +.02	62.1 −0.2	17.74 +.01	72.2 −0.9	51.90 −.01	81.5 −2.8
16.0	38.07 .11	68.5 3.5	9.99 .06	62.1 0.4	17.77 .04	71.3 1.1	51.91 +.04	78.5 3.0
26.0	38.23 .20	65.0 3.6	10.06 .09	62.4 0.6	17.83 .08	70.1 1.3	51.98 .10	75.4 3.2
Oct. 5.9	38.48 .30	61.4 3.5	10.17 .13	62.9 0.9	17.93 .12	68.6 1.5	52.11 .16	72.1 3.3
15.9	38.83 .39	58.0 3.4	10.32 .17	63.7 1.2	18.07 .16	67.0 1.7	52.29 .22	68.9 3.3
25.9	39.27 +.49	54.6 −3.2	10.51 +.21	64.8 −1.5	18.25 +.20	65.2 −1.9	52.54 +.28	65.6 −3.2
Nov. 4.8	39.80 .57	51.5 2.9	10.74 .24	66.1 1.7	18.47 .24	63.1 2.1	52.85 .34	62.4 3.1
14.8	40.41 .65	48.7 2.6	11.00 .28	67.7 1.9	18.73 .27	61.0 2.2	53.22 .39	59.4 2.9
24.8	41.09 .71	46.4 2.2	11.29 .31	69.5 2.0	19.02 .30	58.8 2.2	53.63 .43	56.7 2.6
Dec. 4.8	41.83 .75	44.4 1.7	11.60 .32	71.5 2.1	19.34 .32	56.6 2.2	54.08 .47	54.3 2.2
14.7	42.59 +.77	43.1 −1.1	11.93 +.33	73.6 −2.1	19.67 +.33	54.4 −2.1	54.56 +.49	52.4 −1.7
24.7	43.37 .76	42.3 −0.5	12.26 .32	75.7 2.1	20.01 .33	52.3 2.0	55.05 .49	50.9 1.2
34.7	44.12 +.74	42.1 +0.1	12.58 +.31	77.8 −2.1	20.34 +.32	50.5 −1.8	55.55 +.48	50.0 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*o* Virginis.		4 Draconis (H.)		γ Corvi.		β Chamæleontis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 11 59	+ 9° 21′	h m 12 6	+78° 14′	h m 12 9	−16° 54′	h m 12 11	−78° 40′
	s	″	s	″	s	″	s	″
(Dec.30.7)	26.78 +.33	36.8 −2.0	51.74+1.21	22.5 −0.4	59.55 +.33	43.9 −2.1	47.12+1.19	41.0 −1.4
Jan. 9.7	27.10 .31	34.9 1.8	52.94 1.17	22.4 +0.2	59.88 .31	46.1 2.2	48.29 1.13	42.7 1.9
19.7	27.40 .29	33.3 1.5	54.09 1.10	22.9 0.8	60.18 .29	48.4 2.3	49.38 1.03	45.0 2.5
29.6	27.67 .25	31.9 1.2	55.15 1.00	24.0 1.4	60.46 .26	50.7 2.2	50.35 .91	47.6 2.9
Feb. 8.6	27.91 .21	30.8 0.9	56.08 .86	25.7 2.0	60.70 .22	52.9 2.1	51.19 .76	50.7 3.2
18.6	28.10 +.17	30.1 −0.6	56.86 +.69	28.0 +2.4	60.90 +.18	54.9 −2.0	51.87 +.60	54.1 −3.5
28.6	28.25 .13	29.6 −0.3	57.46 .50	30.6 2.8	61.06 .14	56.8 1.8	52.39 .43	57.8 3.7
Mar. 10.5	28.36 .09	29.5 0.0	57.85 .30	33.5 3.0	61.18 .10	58.5 1.6	52.74 .26	61.5 3.8
20.5	28.43 .05	29.6 +0.3	58.05 +.09	36.6 3.1	61.26 .06	60.0 1.3	52.92 +.10	65.3 3.8
30.5	28.46 +.01	30.0 0.5	58.04 −.11	39.8 3.1	61.30 +.02	61.2 1.1	52.93 −.07	69.1 3.7
Apr. 9.5	28.46 −.01	30.5 +0.6	57.84 −.29	42.8 +3.0	61.30 −.01	62.2 −0.9	52.78 −.23	72.7 −3.5
19.4	28.42 .05	31.3 0.8	57.45 .46	45.7 2.7	61.28 .04	62.9 0.6	52.47 .38	76.1 3.3
29.4	28.37 .07	32.1 0.8	56.91 .60	48.2 2.4	61.23 .06	63.4 0.4	52.03 .51	79.2 3.0
May 9.4	28.29 .08	32.9 0.9	56.25 .72	50.4 2.0	61.16 .08	63.8 −0.2	51.45 .64	82.1 2.6
19.3	28.20 .10	33.8 0.9	55.47 .81	52.2 1.5	61.08 .09	63.9 0.0	50.75 .74	84.5 2.2
29.3	28.10 −.10	34.6 +0.8	54.63 −.87	53.4 +1.0	60.98 −.10	63.7 +0.2	49.96 −.83	86.4 −1.7
June 8.3	27.99 .11	35.4 0.8	53.73 .90	54.1 +0.4	60.87 .11	63.5 0.4	49.09 .90	87.9 1.2
18.3	27.88 .11	36.2 0.7	52.83 .90	54.2 −0.1	60.76 .12	63.0 0.6	48.15 .95	88.9 0.7
28.2	27.77 .11	36.8 0.6	51.93 .89	53.9 0.7	60.64 .12	62.4 0.7	47.18 .97	89.3 −0.1
July 8.2	27.67 .10	37.4 0.5	51.06 .84	52.9 1.2	60.52 .12	61.6 0.8	46.20 .97	89.2 +0.4
18.2	27.57 −.10	37.8 +0.4	50.24 −.78	51.4 −1.7	60.41 −.11	60.7 +0.9	45.24 −.94	88.5 +0.9
28.1	27.47 .09	38.1 0.2	49.50 .70	49.5 2.2	60.30 .10	59.7 1.0	44.33 .88	87.3 1.4
Aug. 7.1	27.39 .07	38.3 +0.1	48.85 .60	47.1 2.6	60.20 .09	58.6 1.1	43.49 .79	85.6 1.9
17.1	27.33 .05	38.3 −0.1	48.30 .49	44.3 3.0	60.12 .07	57.5 1.1	42.76 .67	83.5 2.3
27.1	27.29 −.03	38.1 0.3	47.88 .36	41.2 3.3	60.06 .05	56.4 1.0	42.16 .52	80.9 2.7
Sept. 6.0	27.27 .00	37.7 −0.5	47.59 −.22	37.8 −3.5	60.02 −.02	55.4 +0.9	41.72 −.35	78.1 +2.9
16.0	27.28 +.03	37.0 0.7	47.44 −.07	34.2 3.7	60.02 +.02	54.5 0.8	41.46 −.16	75.1 3.0
26.0	27.33 .06	36.2 1.0	47.45 +.09	30.5 3.8	60.05 .05	53.8 0.6	41.40 +.04	72.1 3.1
Oct. 6.0	27.41 .10	35.1 1.2	47.61 .25	26.7 3.8	60.12 .09	53.3 0.4	41.55 .25	69.0 3.0
15.9	27.53 .14	33.8 1.5	47.94 .41	22.9 3.7	60.24 .14	53.1 +0.1	41.92 .46	66.1 2.7
25.9	27.70 +.18	32.2 −1.7	48.44 +.57	19.3 −3.5	60.40 +.18	53.2 −0.3	42.48 +.66	63.5 +2.4
Nov. 4.9	27.90 .22	30.4 1.9	49.09 .73	15.9 3.3	60.60 .23	53.7 0.6	43.23 .83	61.3 2.0
14.8	28.15 .26	28.4 2.0	49.90 .88	12.7 3.0	60.85 .27	54.5 1.0	44.14 .98	59.6 1.5
24.8	28.42 .29	26.4 2.1	50.85 1.00	9.9 2.5	61.13 .30	55.6 1.3	45.20 1.10	58.4 0.9
Dec. 4.8	28.73 .31	24.2 2.2	51.91 1.10	7.6 2.0	61.44 .32	57.1 1.6	46.35 1.18	57.8 +0.3
14.8	29.05 +.33	22.0 −2.2	53.05+1.17	5.8 −1.5	61.77 +.33	58.9 −1.9	47.55+1.22	57.9 −0.4
24.7	29.38 .33	19.9 2.1	54.25 1.21	4.6 0.9	62.10 .33	60.9 2.1	48.78 1.21	58.6 1.0
34.7	29.71 +.32	17.9 −2.0	55.47+1.20	4.1 −0.2	62.44 +.33	63.0 −2.2	49.98+1.17	59.9 −1.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Virginis.		α^1 Crucis.		β Corvi.		κ Draconis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 12 14	° ′ − 0 2	h m 12 20	° ′ −62 28	h m 12 28	° ′ −22 46	h m 12 28	° ′ +70 24
	s	″	s	″	s	″	s	″
(Dec. 30.7)	7.12 +.32	17.3 −2.1	19.05 +.58	0.5 −1.6	26.89 +.34	7.4 −2.1	37.55 +.77	24.8 −1.0
Jan. 9.7	7.43 .31	19.4 2.0	19.61 .55	2.4 2.1	27.23 .33	9.6 2.2	38.31 .76	24.1 −0.3
19.7	7.74 .29	21.3 1.9	20.14 .50	4.8 2.6	27.55 .31	11.9 2.3	39.06 .72	24.1 +0.3
29.6	8.01 .26	23.1 1.6	20.62 .45	7.5 2.9	27.85 .28	14.2 2.3	39.76 .67	24.8 0.9
Feb. 8.6	8.25 .22	24.6 1.4	21.03 .38	10.6 3.2	28.11 .24	16.5 2.3	40.40 .59	26.0 1.5
18.6	8.46 +.18	25.9 −1.1	21.38 +.31	13.9 −3.4	28.33 +.20	18.8 −2.2	40.93 +.49	27.8 +2.0
28.6	8.62 .14	26.9 0.8	21.66 .24	17.3 3.5	28.51 .16	20.9 2.1	41.37 .38	30.1 2.5
Mar. 10.5	8.74 .10	27.6 0.6	21.86 .16	20.8 3.5	28.65 .12	22.9 1.9	41.69 .26	32.8 2.8
20.5	8.82 .06	28.0 0.3	21.98 .09	24.3 3.4	28.75 .08	24.7 1.7	41.88 .13	35.6 3.0
30.5	8.87 +.03	28.2 −0.1	22.04 +.02	27.7 3.3	28.81 .04	26.2 1.5	41.96 +.02	38.7 3.0
Apr. 9.5	8.88 .00	28.2 +0.1	22.02 −.05	30.9 −3.1	28.84 +.01	27.6 −1.2	41.91 −.10	41.7 +3.0
19.4	8.86 −.03	28.0 0.3	21.94 .11	33.9 2.9	28.83 −.02	28.7 1.0	41.76 .20	44.6 2.8
29.4	8.82 .05	27.6 0.4	21.81 .16	36.6 2.6	28.80 .04	29.6 0.8	41.51 .29	47.4 2.6
May 9.4	8.76 .07	27.2 0.5	21.62 .21	39.0 2.2	28.74 .07	30.2 0.5	41.17 .37	49.8 2.2
19.3	8.68 .08	26.6 0.6	21.38 .25	41.0 1.8	28.67 .08	30.6 0.3	40.77 .43	51.8 1.8
29.3	8.59 −.09	26.0 +0.6	21.11 −.29	42.6 −1.4	28.57 −.10	30.8 −0.1	40.31 −.47	53.4 +1.3
June 8.3	8.49 .10	25.3 0.7	20.80 .32	43.7 0.9	28.47 .11	30.7 +0.2	39.82 .50	54.5 0.8
18.3	8.38 .11	24.6 0.7	20.47 .34	44.4 −0.4	28.35 .12	30.4 0.4	39.31 .51	55.1 +0.3
28.2	8.28 .11	23.9 0.7	20.12 .35	44.5 +0.1	28.23 .12	30.0 0.6	38.79 .52	55.1 −0.2
July 8.2	8.17 .11	23.3 0.6	19.76 .36	44.2 0.6	28.10 .13	29.3 0.8	38.28 .50	54.6 0.7
18.2	8.07 −.10	22.6 +0.6	19.41 −.35	43.4 +1.0	27.97 −.13	28.4 +0.9	37.79 −.47	53.6 −1.3
28.2	7.97 .09	22.0 0.5	19.06 .33	42.1 1.5	27.85 .12	27.4 1.1	37.33 .44	52.1 1.7
Aug. 7.1	7.88 .08	21.5 0.4	18.75 .30	40.4 1.9	27.73 .11	26.3 1.2	36.92 .39	50.2 2.2
17.1	7.81 .06	21.1 0.3	18.47 .25	38.4 2.2	27.63 .09	25.1 1.2	36.56 .33	47.7 2.6
27.1	7.75 .04	20.9 +0.2	18.24 .20	36.0 2.5	27.55 .07	23.8 1.2	36.26 .26	45.0 2.9
Sept. 6.0	7.72 −.02	20.7 0.0	18.07 −.13	33.4 +2.7	27.49 −.04	22.6 +1.2	36.04 −.18	41.9 −3.2
16.0	7.71 +.01	20.8 −0.2	17.98 −.05	30.7 2.7	27.47 −.01	21.4 1.1	35.90 −.09	38.5 3.5
26.0	7.74 .05	21.1 0.4	17.97 +.03	28.0 2.7	27.48 +.03	20.4 0.9	35.86 .00	35.0 3.6
Oct. 6.0	7.81 .09	21.6 0.7	18.04 .12	25.3 2.6	27.53 .08	19.5 0.7	35.90 +.10	31.3 3.7
15.9	7.92 .13	22.4 0.9	18.21 .21	22.8 2.3	27.63 .12	19.0 0.4	36.05 .20	27.5 3.7
25.9	8.07 +.17	23.5 −1.2	18.47 +.30	20.6 +2.0	27.78 +.17	18.7 +0.1	36.31 +.31	23.8 −3.7
Nov. 4.9	8.26 .21	24.8 1.5	18.81 .38	18.9 1.5	27.97 .22	18.7 −0.3	36.67 .41	20.2 3.5
14.9	8.50 .25	26.4 1.7	19.23 .45	17.6 1.0	28.21 .26	19.2 0.6	37.14 .51	16.8 3.2
24.8	8.76 .28	28.2 1.9	19.72 .51	16.8 +0.5	28.49 .29	20.0 1.0	37.70 .60	13.8 2.9
Dec. 4.8	9.06 .31	30.1 2.0	20.26 .55	16.6 −0.1	28.80 .32	21.2 1.4	38.34 .67	11.0 2.5
14.8	9.38 +.32	32.2 −2.1	20.83 +.58	17.0 −0.7	29.13 +.34	22.8 −1.7	39.05 +.73	8.8 −1.9
24.7	9.70 .33	34.4 2.1	21.41 .58	18.0 1.3	29.48 .35	24.6 1.9	39.80 .76	7.2 1.4
34.7	10.03 +.32	36.5 −2.1	21.98 +.57	19.6 −1.8	29.82 +.34	26.6 −2.1	40.57 +.77	6.1 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	32³ Camelop. (H.)		α Can. Venaticorum.		θ Virginis.		α Virginis. (*Spica.*)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 12 48	° ′ +84 1	h m 12 50	° ′ +38 55	h m 13 4	° ′ − 4 56	h m 13 19	° ′ −10 34
	s	″	s	″	s	″	s	″
(Dec. 30.7)	12.15 +2.18	22.1 −0.9	43.48 +.38	34.7 −1.9	5.32 +.32	2.1 −2.2	13.73 +.33	8.3 −2.0
Jan. 9.7	14.38 2.23	21.6 −0.2	43.87 .38	33.1 1.4	5.64 .32	4.1 2.1	14.06 .32	10.3 2.0
19.7	16.60 2.18	21.6 +0.4	44.25 .37	31.9 0.9	5.96 .31	6.1 1.9	14.38 .31	12.3 2.0
29.7	18.74 2.04	22.4 1.1	44.60 .34	31.3 −0.3	6.26 .29	8.0 1.8	14.68 .29	14.3 1.9
Feb. 8.6	20.69 1.84	23.8 1.6	44.93 .31	31.2 +0.2	6.53 .26	9.7 1.6	14.97 .27	16.1 1.8
18.6	22.41 +1.57	25.7 +2.2	45.21 +.26	31.7 +0.7	6.77 +.22	11.2 −1.4	15.22 +.24	17.8 −1.6
28.6	23.83 1.24	28.1 2.6	45.45 .21	32 6 1.1	6.98 .19	12.5 1.1	15.44 .20	19.3 1.4
Mar. 10.6	24.89 .88	30.9 2.9	45.64 .16	34.0 1.5	7.15 .15	13.5 0.9	15.62 .17	20.5 1.1
20.5	25.58 .49	33 9 3.1	45.78 .11	35.7 1.8	7.28 .11	14.2 0.6	15.77 .13	21.6 0.9
30.5	25.88 +.11	37.1 3.2	45.86 .06	37.6 2.1	7.37 .08	14.7 0.4	15.88 .10	22.4 0.7
Apr. 9.5	25.80 −.28	40.2 +3.1	45.90 +.02	39.8 +2.2	7.43 +.05	14.9 −0.2	15.96 +.06	23.0 −0.5
19.4	25.33 .64	43.3 2.9	45.90 −.02	42.0 2.2	7.47 +.02	15.0 0.0	16.01 .03	23.4 0.3
29.4	24.52 .97	46.1 2.7	45.86 .06	44.2 2.2	7.47 −.01	14.9 +0.2	16.03 +.01	23.6 −0.1
May 9.4	23.39 1.25	48.6 2.3	45.78 .09	46.3 2.0	7.45 .03	14.6 0.3	16.02 −.02	23.6 0.0
19.4	22.01 1.49	50.7 1.9	45.68 .12	48.3 1.8	7.41 .05	14.2 0.4	15.99 .04	23.5 +0.2
29.3	20.41 −1.68	52.3 +1.4	45.55 −.14	50.0 +1 6	7.35 −.07	13.8 +0.5	15.94 −.06	23.3 +0.3
June 8.3	18.65 1.81	53.5 0.8	45.40 .15	51.4 1.3	7.27 .08	13.2 0.6	15.87 .08	22.9 0.4
18.3	16.80 1.88	54.0 +0.3	45.24 .16	52.5 0.9	7.18 .10	12.6 0.6	15.79 .09	22.5 0.5
28.3	14.89 1.91	54.0 −0.3	45.08 .17	53.3 0.6	7.08 .11	12.0 0.6	15.69 .10	22.0 0.6
July 8.2	12.98 1.88	53.5 0.8	44.91 .17	53.6 +0.2	6.97 .11	11.3 0.6	15.58 .11	21.4 0.6
18.2	11.12 1.81	52.4 −1.4	44.74 −.17	53.6 −0.2	6.85 −.12	10.7 +0.6	15.46 −.12	20.8 +0.6
28.2	9.36 1.70	50.8 1.8	44.57 .15	58.3 0.6	6.74 .12	10.1 0.6	15.34 .13	20.1 0.7
Aug. 7.1	7.73 1.54	48.7 2.3	44.42 .14	52.5 1.0	6.62 .11	9.5 0.6	15.21 .12	19.4 0.7
17.1	6.27 1.35	46.2 2.7	44.28 .13	51.3 1.3	6.51 .10	8.9 0.5	15.09 .11	18.8 0.7
27.1	5.02 1.13	43.2 3.1	44.16 .11	49.9 1.6	6.42 .08	8.5 0.4	14.99 .10	18.1 0.6
Sept. 6.1	4.00 −.89	40.0 −3.4	44.06 −.08	48.0 −2.0	6.34 −.06	8.2 +0.3	14.90 −.08	17.6 +0.5
16.0	3.25 .61	36.5 3.6	44.00 −.04	45.9 2.3	6.29 −.04	8.0 +0.1	14.83 .05	17.1 0.4
26.0	2.78 .32	32.8 3.8	43.98 .00	43.4 2.5	6.27 .00	8.0 −0.1	14.80 −.02	16.8 +0.2
Oct. 6.0	2.61 −.01	29.0 3.8	44.00 +.04	40.8 2.8	6.29 +.04	8.2 0.3	14.80 +.02	16.7 0.0
16.0	2.76 +.32	25.1 3.8	44.07 .09	37.9 3.0	6.35 .08	8.7 0.6	14.84 .07	16.8 −0.3
25.9	3.24 +.65	21.3 −3.7	44.19 +.15	34.9 −3.1	6.45 +.13	9.4 −0.9	14.94 +.11	17.2 −0.5
Nov. 4.9	4.06 .97	17.7 3.5	44.36 .20	31.8 3.1	6.60 .17	10.4 1.1	15.07 .16	17.8 0.8
14.9	5.19 1.28	14.2 3.3	44.59 .25	28.7 3.1	6.80 .21	11.7 1.4	15.26 .21	18.8 1.1
24.8	6.62 1.57	11.1 2.9	44.86 .30	25.6 3.0	7.03 .25	13.2 1.6	15.49 .25	20.0 1.3
Dec. 4.8	8.33 1.82	8.4 2.5	45.18 .33	22.7 2.8	7.30 .28	15.0 1.8	15.75 .28	21.4 1.6
14.8	10.27 +2.02	6.2 −1.9	45.53 +.36	20.1 −2.5	7.60 +.31	16.9 −2.0	16.05 +.31	23.1 −1.8
24.8	12.38 2.16	4.6 1.3	45.91 .38	17.7 2.1	7 92 .32	18.9 2.1	16.37 .32	25.0 1.9
34.7	14.60 +2.24	3.6 −0.7	46.30 +.39	15.8 −1.7	8.25 +.33	21.0 −2.1	16.70 +.33	27.0 −2.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Virginis.		η Ursæ Majoris.		η Bootis.		β Centauri.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	13h 28m	− 0° 0′	13h 43m	+49° 52′	13h 49m	+18° 57′	13h 55m	−59° 49′
	s	″	s	″	s	″	s	″
(Dec. 30.8)	55.30 +.32	59.4 −2.1	3.68 +.42	29.6 −2.2	17.17 +.32	51.4 −2.3	50.38 +.55	15.6 −0.4
Jan. 9.8	55.62 .32	61.5 2.0	4.11 .43	27.6 1.7	17.50 .33	49.2 2.0	50.93 .56	16.3 0.9
19.7	55.94 .31	63.4 1.9	4.55 .43	26.1 1.1	17.83 .33	47.4 1.6	51.49 .55	17.5 1.4
29.7	56.24 .29	65.2 1.7	4.98 .42	25.3 −0.5	18.15 .31	45.8 1.3	52.03 .53	19.1 1.8
Feb. 8.7	56.53 .27	66.8 1.4	5.38 .39	25.1 +0.1	18.45 .29	44.7 0.9	52.54 .49	21.2 2.2
18.7	56.78 +.24	68.1 −1.2	5.76 +.35	25.5 +0.7	18.73 +.26	44.0 −0.5	53.02 +.45	23.5 −2.5
28.6	57.01 .21	69.1 0.9	6.09 .31	26.5 1.2	18.98 .23	43.7 −0.1	53.45 .40	26.1 2.7
Mar. 10.6	57.20 .17	69.8 0.6	6.37 .25	28.0 1.7	19.20 .20	43.9 +0.3	53.82 .35	28.9 2.9
20.6	57.35 .14	70.3 0.3	6.60 .20	29.9 2.1	19.37 .16	44.4 0.7	54.14 .29	31.9 3.0
30.5	57.47 .10	70.5 −0.1	6.77 .14	32.2 2.4	19.52 .12	45.3 1.0	54.39 .23	34.9 3.0
Apr. 9.5	57.56 +.07	70.4 +0.2	6.88 +.08	34.8 +2.6	19.62 +.09	46.4 +1.3	54.59 +.17	37.9 −3.0
19.5	57.61 .04	70.1 0.4	6.93 +.03	37.4 2.7	19.69 .05	47.8 1.4	54.72 .11	40.8 2.9
29.5	57.64 +.01	69.7 0.5	6.94 −.02	40.2 2.7	19.73 +.02	49.3 1.5	54.80 +.05	43.7 2.8
May 9.4	57.64 −.01	69.1 0.6	6.89 .07	42.8 2.6	19.74 −.01	50.9 1.6	54.81 −.01	46.3 2.6
19.4	57.62 .03	68.5 0.7	6.80 .11	45.3 2.4	19.72 .03	52.4 1.5	54.77 .07	48.8 2.3
29.4	57.57 −.05	67.8 +0.7	6.67 −.15	47.6 +2.1	19.67 −.05	53.9 +1.5	54.68 −.12	51.0 −2.0
June 8.3	57.51 .07	67.1 0.7	6.51 .18	49.6 1.8	19.61 .08	55.4 1.3	54.53 .17	52.8 1.7
18.3	57.43 .09	66.3 0.7	6.32 .20	51.2 1.4	19.52 .10	56.6 1.2	54.33 .22	54.4 1.3
28.3	57.33 .10	65.6 0.7	6.10 .22	52.4 1.0	19.42 .11	57.7 1.0	54.09 .26	55.5 0.9
July 8.3	57.22 .11	64.9 0.7	5.87 .24	53.1 0.5	19.30 .12	58.6 0.8	53.82 .29	56.2 0.5
18.2	57.11 −.12	64.3 +0.6	5.63 −.24	53.4 +0.1	19.17 −.13	59.2 +0.5	53.51 −.31	56.5 −0.1
28.2	56.98 .12	63.7 0.5	5.39 .24	53.3 −0.4	19.03 .14	59.6 +0.3	53.19 .33	56.3 +0.4
Aug. 7.2	56.86 .12	63.3 0.4	5.15 .24	52.7 0.8	18.89 .14	59.7 0.0	52.85 .33	55.7 0.8
17.2	56.74 .11	62.9 0.3	4.91 .23	51.6 1.3	18.75 .14	59.6 −0.3	52.52 .32	54.7 1.2
27.1	56.63 .10	62.7 +0.2	4.69 .21	50.1 1.7	18.61 .13	59.1 0.6	52.21 .30	53.2 1.6
Sept. 6.1	56.54 −.08	62.6 0.0	4.50 −.18	48.1 −2.1	18.50 −.11	58.4 −0.9	51.93 −.26	51.4 +1.9
16.1	56.46 .06	62.7 −0.2	4.34 .14	45.8 2.5	18.40 .08	57.4 1.1	51.70 .20	49.3 2.2
26.0	56.42 −.03	63.0 0.4	4.22 .10	43.1 2.8	18.33 .05	56.1 1.4	51.53 .14	47.1 2.3
Oct. 6.0	56.41 +.01	63.5 0.6	4.15 −.05	40.2 3.1	18.29 −.01	54.5 1.7	51.43 −.06	44.6 2.4
16.0	56.44 .05	64.2 0.9	4.13 +.01	36.9 3.3	18.30 +.03	52.7 2.0	51.41 +.03	42.2 2.4
26.0	56.52 +.10	65.2 −1.1	4.17 +.08	33.5 −3.5	18.35 +.07	50.6 −2.2	51.48 +.12	39.9 +2.3
Nov. 4.9	56.65 .15	66.5 1.4	4.28 .14	30.0 3.5	18.45 .12	48.3 2.4	51.65 .21	37.7 2.0
14.9	56.82 .19	68.0 1.6	4.45 .20	26.4 3.5	18.59 .17	45.8 2.5	51.90 .29	35.8 1.7
24.9	57.03 .23	69.7 1.8	4.69 .27	22.9 3.4	18.79 .22	43.2 2.6	52.23 .37	34.2 1.3
Dec. 4.8	57.28 .27	71.6 2.0	4.99 .32	19.6 3.2	19.03 .26	40.6 2.6	52.64 .44	33.2 0.9
14.8	57.57 +.30	73.7 −2.1	5.33 +.37	16.5 −2.0	19.30 +.29	38.0 −2.6	53.12 +.50	32.5 +0.4
24.8	57.88 .31	75.8 2.1	5.72 .41	13.7 2.5	19.61 .32	35.4 2.5	53.63 .53	32.4 −0.1
34.8	58.20 +.32	77.9 −2.1	6.15 +.43	11.4 −2.0	19.93 +.33	33.1 −2.2	54.18 +.55	32.8 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Draconis.		*α* Bootis. (*Arcturus.*)		*θ* Bootis.		*ρ* Bootis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 14 1	° ′ +64 54	h m 14 10	° ′ +19 45	h m 14 21	° ′ +52 21	h m 14 26	° ′ +30 51
	s	″	s	″	s	″	s	″
(Dec.30.8)	17.37 +.57	47.0 −2.3	29.24 +.32	75.5 −2.4	19.12 +.41	76.1 −2.6	56.22 +.32	61.2 −2.6
Jan. 9.8	17.95 .59	45.0 1.7	29.56 .32	73.2 2.2	19.54 .43	73.8 2.1	56.56 .34	58.8 2.2
19.8	18.55 .60	43.7 1.0	29.88 .32	71.2 1.8	19.98 .44	71.9 1.5	56.90 .34	56.8 1.8
29.7	19.16 .60	43.0 −0.4	30.20 .32	69.5 1.5	20.43 .44	70.7 0.9	57.25 .34	55.2 1.3
Feb. 8.7	19.75 .57	42.9 +0.3	30.51 .30	68.3 1.2	20.86 .42	70.2 −0.3	57.58 .33	54.1 0.8
18.7	20.30 +.52	43.5 +0.9	30.80 +.27	67.5 −0.6	21.28 +.40	70.2 +0.4	58.90 +.30	53.6 −0.3
28.7	20.80 .46	44.8 1.5	31.06 .24	67.1 −0.1	21.66 .36	70.9 1.0	58.19 .27	53.6 +0.2
Mar. 10.6	21.22 .39	46.6 2.0	31.29 .21	67.2 +0.3	21.99 .31	72.2 1.5	58.45 .24	54.1 0.7
20.6	21.57 .31	48.8 2.4	31.49 .18	67.7 0.7	22.27 .26	73.9 2.0	58.67 .21	55.1 1.2
30.6	21.84 .22	51.5 2.7	31.65 .14	68.5 1.0	22.50 .20	76.1 2.4	58.86 .17	56.4 1.5
Apr. 9.5	22.02 +.13	54.4 +3.0	31.77 +.11	69.7 +1.2	22.67 +.14	78.6 +2.6	59.01 +.13	58.1 +1.8
19.5	22.11 +.04	57.4 3.1	31.86 .07	71.0 1.4	22.78 .08	81.4 2.8	59.12 .09	60.1 2.0
29.5	22.11 −.04	60.5 3.0	31.92 .04	72.6 1.6	22.84 +.03	84.2 2.8	59.19 .05	62.2 2.2
May 9.5	22.02 .12	63.5 2.9	31.94 +.01	74.2 1.6	22.84 −.03	87.1 2.8	59.22 +.02	64.4 2.2
19.4	21.87 .19	66.3 2.7	31.94 −.02	75.8 1.6	22.79 .08	89.9 2.7	59.23 −.01	66.6 2.2
29.4	21.65 −.25	68.8 +2.4	31.91 −.04	77.4 +1.5	22.68 −.12	92.4 +2.4	59.19 −.05	68.7 +2.0
June 8.4	21.36 .31	71.0 2.0	31.85 .07	78.9 1.4	22.54 .16	94.7 2.1	59.13 .07	70.7 1.9
18.4	21.03 .35	72.7 1.5	31.78 .09	80.2 1.2	22.36 .20	96.7 1.8	59.05 .10	72.5 1.6
28.3	20.66 .38	74.0 1.0	31.68 .11	81.4 1.0	22.15 .23	98.3 1.4	58.93 .12	73.9 1.3
July 8.3	20.26 .41	74.8 +0.5	31.56 .13	82.3 0.8	21.91 .25	99.4 0.9	58.80 .14	75.2 1.0
18.3	19.84 −.42	75.1 0.0	31.43 −.14	83.0 +0.6	21.65 −.27	100.1 +0.5	58.64 −.16	76.0 +0.7
28.2	19.41 .43	74.9 −0.5	31.28 .15	83.4 +0.3	21.37 .28	100.3 0.0	58.48 .17	76.6 +0.3
Aug. 7.2	18.99 .42	74.1 1.0	31.13 .15	83.6 0.0	21.09 .28	100.1 −0.5	58.30 .18	76.7 0.0
17.2	18.57 .40	72.8 1.5	30.98 .15	83.5 −0.3	20.81 .28	99.3 1.0	58.12 .18	76.5 −0.4
27.2	18.18 .37	71.1 2.0	30.83 .14	83.1 0.6	20.54 .26	98.1 1.5	57.94 .17	75.9 0.8
Sept. 6.1	17.82 −.33	68.9 −2.4	30.69 −.13	82.4 −0.9	20.28 −.24	96.4 −1.9	57.78 −.16	75.0 −1.1
16.1	17.51 .28	66.3 2.8	30.58 .10	81.3 1.2	20.06 .21	94.3 2.3	57.63 .13	73.6 1.5
26.1	17.26 .22	63.3 3.1	30.48 .08	80.0 1.5	19.87 .17	91.8 2.7	57.51 .11	72.0 1.8
Oct. 6.1	17.08 .15	60.0 3.4	30.42 −.04	78.4 1.7	19.73 .12	88.9 3.0	57.42 .07	69.9 2.2
16.0	16.97 −.06	56.4 3.6	30.40 .00	76.6 2.0	19.64 −.06	85.7 3.3	57.37 −.03	67.6 2.4
26.0	16.95 +.03	52.7 −3.8	30.43 +.05	74.4 −2.2	19.61 +.01	82.3 −3.5	57.37 +.02	65.0 −2.7
Nov. 5.0	17.02 .12	48.9 3.8	30.50 .10	72.1 2.5	19.65 .07	78.7 3.6	57.42 .08	62.2 2.9
14.9	17.19 .21	45.1 3.8	30.63 .15	69.5 2.6	19.76 .15	75.1 3.7	57.53 .13	59.2 3.0
24.9	17.45 .31	41.4 3.6	30.80 .19	66.8 2.7	19.94 .22	71.4 3.6	57.68 .18	56.1 3.1
Dec. 4.9	17.81 .40	37.8 3.4	31.01 .24	64.1 2.7	20.19 .28	67.8 3.5	57.90 .23	53.0 3.1
14.9	18.24 +.47	34.6 −3.0	31.27 +.28	61.3 −2.6	20.50 +.34	64.4 −3.2	58.15 +.27	50.0 −3.0
24.8	18.75 .53	31.7 2.6	31.57 .30	58.7 2.6	20.87 .38	61.4 2.9	58.44 .31	47.1 2.8
34.8	19.31 +.58	29.4 −2.1	31.88 +.32	56.2 −2.4	21.27 +.42	58.7 −2.4	58.77 +.34	44.5 −2.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	5 Ursæ Minoris.		α² Centauri.		ε Bootis.		α² Libræ.	
	Right Ascension	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 14 27	+76° 11′	h m 14 31	−60° 21′	h m 14 40	+27° 32′	h m 14 44	−15° 34′
	s	″	s	″	s	″	s	″
(Dec. 30.8)	41.87 +.85	43.8 −2.4	55.63 +.53	53.8 +0.1	1.73 +.31	62.2 −2.6	36.46 +.31	6.6 −1.5
Jan. 9.8	42.77 .93	41.7 1.8	56.17 .55	54.0 −0.4	2.05 .33	59.8 2.3	36.78 .32	8.1 1.6
19.8	43.73 .98	40.3 1.2	56.73 .55	54.6 0.9	2.38 .33	57.6 1.9	37.10 .33	9.8 1.6
29.7	44.73 1.00	39.4 −0.5	57.28 .54	55.8 1.3	2.72 .33	56.0 1.5	37.43 .32	11.4 1.6
Feb. 8.7	45.73 .98	39.3 +0.2	57.82 .52	57.3 1.7	3.05 .32	54.7 1.0	37.74 .31	13.0 1.6
18.7	46.68 +.94	39.8 +0.9	58.33 +.49	59.2 −2.1	3.36 +.30	54.0 −0.5	38.04 +.29	14.6 −1.5
28.7	47.57 .86	41.0 1.5	58.80 .45	61.4 2.3	3.65 .28	53.8 +0.1	38.32 .27	16.0 1.3
Mar. 10.6	48.36 .73	42.7 2.0	59.22 .40	63.9 2.5	3.91 .25	54.1 0.5	38.58 .24	17.2 1.2
20.6	49.03 .59	45.0 2.4	59.59 .35	66.5 2.7	4.14 .21	54.9 1.0	38.80 .21	18.3 1.0
30.6	49.53 .44	47.6 2.8	59.91 .29	69.2 2.8	4.34 .18	56.1 1.4	39.00 .18	19.2 0.8
Apr. 9.6	49.91 +.29	50.6 +3.0	60.17 +.23	72.0 −2.8	4.50 +.14	57.6 +1.7	39.17 +.15	19.9 −0.6
19.5	50.12 +.13	53.7 3.1	60.37 .17	74.9 2.8	4.62 .10	59.4 1.9	39.31 .12	20.4 0.5
29.5	50.16 −.03	56.9 3.1	60.51 .12	77.7 2.7	4.71 .07	61.4 2.0	39.41 .09	20.8 0.3
May 9.5	50.05 .19	60.0 3.0	60.59 +.05	80.3 2.6	4.76 +.04	63.5 2.1	39.49 .06	21.1 0.2
19.4	49.79 .34	62.9 2.8	60.61 −.01	82.9 2.4	4.78 .00	65.6 2.1	39.54 .04	21.2 −0.1
29.4	49.39 −.46	65.6 +2.5	60.56 −.07	85.2 −2.2	4.76 −.03	67.7 +2.0	39.57 +.01	21.2 0.0
June 8.4	48.88 .57	68.0 2.1	60.46 .13	87.3 2.0	4.72 .06	69.6 1.8	39.56 −.02	21.1 +0.1
18.4	48.25 .66	69.9 1.7	60.30 .19	89.1 1.6	4.65 .08	71.4 1.6	39.53 .05	21.0 0.2
28.3	47.55 .74	71.4 1.2	60.09 .24	90.5 1.3	4.55 .11	72.9 1.4	39.46 .07	20.7 0.3
July 8.3	46.77 .80	72.3 0.7	59.83 .28	91.6 0.9	4.43 .13	74.2 1.1	39.38 .10	20.4 0.3
18.3	45.95 −.83	72.8 +0.2	59.53 −.32	92.3 −0.5	4.29 −.15	75.1 +0.8	39.27 −.12	20.1 +0.4
28.3	45.10 .85	72.7 −0.3	59.19 .34	92.5 0.0	4.13 .16	75.8 0.5	39.14 .14	19.6 0.4
Aug. 7.2	44.25 .85	72.1 0.9	58.84 .36	92.3 +0.4	3.96 .17	76.1 +0.1	39.00 .15	19.2 0.5
17.2	43.40 .83	70.9 1.4	58.48 .36	91.7 0.8	3.78 .17	76.0 −0.2	38.85 .15	18.7 0.5
27.2	42.59 .78	69.3 1.9	58.12 .34	90.6 1.3	3.61 .17	75.6 0.6	38.70 .15	18.1 0.5
Sept. 6.1	41.84 −.72	67.2 −2.3	57.79 −.31	89.2 +1.6	3.44 −.16	74.8 −0.9	38.55 −.14	17.6 +0.5
16.1	41.15 .64	64.6 2.8	57.50 .27	87.4 1.9	3.29 .14	73.7 1.3	38.42 .12	17.1 0.5
26.1	40.56 .54	61.6 3.1	57.25 .21	85.3 2.2	3.16 .11	72.2 1.6	38.31 .09	16.7 0.4
Oct. 6.1	40.08 .42	58.4 3.4	57.08 .14	83.1 2.3	3.07 .08	70.5 1.9	38.23 .06	16.4 0.3
16.0	39.73 .28	54.8 3.6	56.98 −.05	80.7 2.4	3.01 −.04	68.3 2.3	38.19 −.02	16.2 +0.1
26.0	39.52 −.13	51.1 −3.8	56.97 +.04	78.3 +2.3	3.00 +.01	66.0 −2.5	38.20 +.03	16.1 −0.1
Nov. 5.0	39.47 +.03	47.2 3.8	57.06 .13	76.0 2.2	3.03 .06	63.3 2.7	38.25 .08	16.3 0.3
15.0	39.58 .19	43.3 3.8	57.23 .22	73.9 2.0	3.12 .12	60.5 2.9	38.36 .13	16.7 0.5
24.9	39.86 .36	39.5 3.7	57.50 .31	72.1 1.6	3.27 .17	57.5 3.0	38.52 .18	17.4 0.8
Dec. 4.9	40.29 .51	35.9 3.5	57.86 .39	70.7 1.2	3.46 .22	54.5 3.0	38.72 .23	18.3 1.0
14.9	40.89 +.66	32.6 −3.1	58.28 +.45	69.6 +0.8	3.70 +.26	51.5 −2.9	38.97 +.26	19.5 −1.2
24.8	41.62 .79	29.6 2.7	58.76 .50	69.1 +0.3	3.98 .29	48.7 2.8	39.25 .30	20.8 1.4
34.8	42.46 +.89	27.2 −2.2	59.29 +.54	69.0 −0.2	4.29 +.32	46.0 −2.5	39.56 +.32	22.3 −1.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Ursæ Minoris.		β Bootis.		β Libræ.		μ¹ Bootis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 14 50	+74° 36′	h m 14 57	+40° 49′	h m 15 10	− 8° 57′	h m 15 20	+37° 46′
	s	″	s	″	s	″	s	″
(Dec. 30.8)	58.18 +.75	53.7 −2.7	39.63 +.32	68.1 −2.9	54.26 +.29	45.8 −1.6	11.53 +.29	24.3 −2.9
Jan. 9.8	58.95 .81	51.3 2.1	39.97 .35	65.5 2.4	54.56 .30	47.4 1.7	11.84 .32	21.5 2.6
19.8	59.80 .87	49.5 1.5	40.33 .37	63.3 2.0	54.87 .31	49.1 1.6	12.18 .34	19.1 2.2
29.8	60.69 .90	48.3 0.8	40.70 .37	61.5 1.4	55.18 .31	50.7 1.6	12.53 .35	17.2 1.7
Feb. 8.7	61.59 .89	47.8 −0.1	41.07 .36	60.4 0.9	55.50 .31	52.2 1.4	12.89 .35	15.8 1.1
18.7	62.47 +.86	48.0 +0.5	41.43 +.35	59.8 −0.3	55.80 +.29	53.6 −1.3	13.24 +.34	15.0 −0.5
28.7	63.31 .80	48.9 1.2	41.77 .32	59.9 +0.3	56.08 .27	54.7 1.1	13.57 .32	14.8 0.0
Mar. 10.7	64.07 .73	50.3 1.7	42.08 .29	60.5 0.9	56.34 .25	55.7 0.8	13.88 .30	15.1 +0.6
20.6	64.73 .60	52.3 2.2	42.35 .25	61.6 1.4	56.58 .23	56.4 0.6	14.16 .26	16.1 1.2
30.6	65.27 .47	54.8 2.6	42.58 .21	63.3 1.8	56.80 .20	56.9 0.4	14.41 .23	17.5 1.6
Apr. 9.6	65.68 +.34	57.6 +2.9	42.78 +.17	65.3 +2.2	56.98 +.17	57.2 −0.2	14.62 +.19	19.3 +2.0
19.5	65.94 .20	60.7 3.1	42.93 .13	67.6 2.4	57.14 .14	57.3 0.0	14.79 .15	21.5 2.3
29.5	66.07 +.06	63.8 3.2	43.03 .08	70.1 2.6	57.27 .12	57.3 +0.1	14.92 .11	23.9 2.4
May 9.5	66.05 −.09	67.0 3.1	43.09 +.04	72.7 2.6	57.37 .09	57.1 0.3	15.01 .07	26.4 2.6
19.5	65.90 .22	70.1 3.0	43.11 .00	75.4 2.6	57.44 .06	56.7 0.3	15.06 +.03	29.0 2.6
29.4	65.61 −.34	73.0 +2.7	43.09 −.04	77.9 +2.5	57.49 +.03	56.3 +0.4	15.07 −.01	31.6 +2.5
June 8.4	65.22 .45	75.5 2.4	43.03 .07	80.3 2.3	57.50 .00	55.9 0.5	15.04 .05	34.0 2.4
18.4	64.71 .55	77.7 2.0	42.94 .11	82.5 2.0	57.49 −.03	55.4 0.5	14.98 .08	36.3 2.1
28.4	64.12 .63	79.5 1.5	42.81 .14	84.3 1.7	57.45 .06	54.9 0.5	14.88 .12	38.3 1.8
July 8.3	63.45 .69	80.8 1.0	42.66 .17	85.9 1.3	57.38 .08	54.4 0.5	14.75 .15	40.0 1.5
18.3	62.73 −.74	81.6 +0.5	42.48 −.19	87.0 +0.9	57.28 −.11	54.0 +0.5	14.58 −.17	41.3 +1.2
28.3	61.98 77	81.8 0.0	42.27 .21	87.7 0.5	57.18 .13	53.5 0.5	14.40 .20	42.3 0.8
Aug. 7.3	61.20 .78	81.6 −0.5	42.06 .22	88.1 +0.1	57.03 .14	53.0 0.4	14.19 .21	42.9 +0.4
17.2	60.42 .77	80.8 1.1	41.83 .23	87.9 −0.3	56.88 .15	52.6 0.4	13.97 .22	43.0 −0.1
27.2	59.65 .75	79.4 1.6	41.60 .22	87.4 0.8	56.72 .15	52.2 0.3	13.75 .22	42.7 0.5
Sept. 6.2	58.93 −.70	77.6 −2.0	41.38 −.21	86.4 −1.2	56.57 −.15	51.9 +0.3	13.53 −.22	42.0 −0.9
16.1	58.25 .64	75.4 2.5	41.18 .19	84.9 1.6	56.42 .13	51.7 0.2	13.32 .20	40.9 1.4
26.1	57.65 .55	72.7 2.9	41.00 .16	83.1 2.0	56.30 .11	51.6 +0.1	13.13 .18	39.3 1.8
Oct. 6.1	57.14 .45	69.6 3.2	40.85 .13	80.9 2.4	56.20 .08	51.6 −0.1	12.97 .14	37.3 2.1
16.1	56.74 .34	66.3 3.5	40.75 .08	78.3 2.7	56.14 −.04	51.7 0.3	12.85 .10	35.0 2.5
26.0	56.47 −.20	62.6 −3.7	40.69 −.03	75.4 −3.0	56.12 .00	52.1 −0.5	12.77 −.05	32.3 −2.8
Nov. 5.0	56.33 −.06	58.8 3.8	40.69 +.03	72.2 3.2	56.14 +.05	52.7 0.7	12.75 .00	29.4 3.0
15.0	56.35 +.09	55.0 3.9	40.75 .09	68.9 3.4	56.22 .10	53.4 0.9	12.78 +.06	26.2 3.2
24.9	56.52 .24	51.1 3.8	40.87 .15	65.5 3.4	56.35 .15	54.4 1.1	12.87 .12	22.9 3.3
Dec. 4.9	56.83 .39	47.4 3.6	41.05 .21	62.0 3.4	56.52 .20	55.7 1.3	13.02 .18	19.6 3.4
14.9	57.30 +.53	43.9 −3.3	41.29 +.26	58.7 −3.3	56.74 +.24	57.0 −1.5	13.22 +.23	16.2 −3.3
24.9	57.90 .65	40.7 3.0	41.57 .30	55.5 3.1	57.00 .27	58.6 1.6	13.48 .27	13.0 3.1
34.8	58.61 +.76	38.0 −2.5	41.89 +.34	52.6 −2.7	57.29 +.30	60.2 −1.6	13.77 +.31	10.0 −2.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ^2 Ursæ Minoris.		α Coronæ Borealis.		α Serpentis.		ε Serpentis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	15 20	+72 13	15 29	+27 5	15 38	+ 6 46	15 45	+ 4 49
	s	″	s	″	s	″	s	″
(Dec.30.9)	50.76 +.57	63.6 −3.0	52.59 +.27	44.4 −2.7	40.63 +.26	59.7 −2.1	9.49 +.26	13.1 −2.1
Jan. 9.8	51.38 .66	60.8 2.5	52.88 .30	41.8 2.5	40.90 .28	57.6 2.1	9.76 .28	11.0 2.0
19.8	52.08 .73	58.6 1.9	53.19 .32	39.4 2.2	41.20 .30	55.6 1.9	10.05 .29	9.1 1.9
29.8	52.83 .77	57.0 1.3	53.52 .32	37.4 1.8	41.50 .30	53.8 1.7	10.35 .30	7.3 1.6
Feb. 8.8	53.61 .78	56.1 −0.6	53.84 .32	35.9 1.3	41.80 .30	52.3 1.4	10.66 .30	5.8 1.4
18.7	54.40 +.78	55.8 +0.1	54.16 +.31	34.9 −0.8	42.10 +.29	51.1 −1.0	10.95 +.29	4.6 −1.1
28.7	55.16 .73	56.2 0.7	54.47 .30	34.4 −0.2	42.39 .28	50.2 0.7	11.24 .28	3.7 0.7
Mar. 10.7	55.86 .67	57.3 1.4	54.76 .28	34.4 +0.3	42.66 .26	49.7 −0.3	11.52 .26	3.1 −0.4
20.7	56.50 .59	58.9 1.9	55.02 .25	34.9 0.8	42.92 .24	49.5 0.0	11.77 .24	2.9 0.0
30.6	57.05 .49	61.1 2.4	55.26 .22	35.9 1.2	43.14 .22	49.7 +0.3	12.00 .22	3.0 +0.3
Apr. 9.6	57.49 +.38	63.7 +2.8	55.46 +.19	37.3 +1.6	43.35 +.19	50.3 +0.6	12.21 +.20	3.5 +0.6
19.6	57.81 .27	66.6 3.0	55.63 .15	39.0 1.8	43.52 .16	51.0 0.9	12.39 .17	4.1 0.8
29.5	58.02 .14	69.7 3.1	55.77 .12	41.0 2.1	43.67 .13	52.0 1.1	12.55 .14	5.1 1.0
May 9.5	58.10 +.02	72.9 3.2	55.88 .09	43.1 2.2	43.79 .10	53.2 1.2	12.68 .11	6.1 1.1
19.5	58.07 −.10	76.1 3.1	55.95 .05	45.3 2.2	43.88 .08	54.5 1.3	12.77 .08	7.3 1.2
29.5	57.91 −.21	79.1 +2.9	55.98 +.02	47.6 +2.2	43.94 +.05	55.8 +1.3	12.84 +.05	8.5 +1.2
June 8.4	57.65 .31	81.9 2.7	55.98 −.01	49.7 2.1	43.97 +.01	57.1 1.3	12.88 +.02	9.8 1.2
18.4	57.29 .41	84.5 2.3	55.95 .05	51.8 1.9	43.97 −.02	58.4 1.2	12.88 −.01	11.0 1.2
28.4	56.83 .49	86.6 1.9	55.88 .08	53.6 1.7	43.94 .05	59.6 1.1	12.86 .04	12.1 1.1
July 8.4	56.31 .57	88.3 1.5	55.79 .11	55.2 1.5	43.88 .07	60.7 1.0	12.81 .07	13.1 1.0
18.3	55.71 −.62	89.5 +1.0	55.66 −.14	56.5 +1.2	43.79 −.10	61.6 +0.9	12.72 −.10	14.0 +0.8
28.3	55.07 .66	90.2 +0.5	55.52 .16	57.5 0.8	43.68 .12	62.4 0.7	12.61 .12	14.8 0.7
Aug. 7.3	54.40 .68	90.5 0.0	55.35 .18	58.1 0.5	43.54 .15	63.0 0.5	12.48 .14	15.4 0.5
17.2	53.71 .69	90.1 −0.6	55.16 .19	58.4 +0.1	43.39 .16	63.4 0.3	12.32 .16	15.9 0.3
27.2	53.01 .68	89.3 1.1	54.97 .19	58.4 −0.2	43.23 .16	63.6 +0.1	12.16 .16	16.1 +0.2
Sept. 6.2	52.34 −.66	87.9 −1.6	54.78 −.19	58.0 −0.6	43.06 −.16	63.7 −0.1	12.00 −.16	16.2 0.0
16.2	51.70 .62	86.1 2.1	54.59 .18	57.2 1.0	42.90 .15	63.5 0.3	11.84 .15	16.1 −0.2
26.1	51.11 .55	83.8 2.5	54.43 .15	56.0 1.3	42.76 .13	63.0 0.5	11.69 .14	15.7 0.5
Oct. 6.1	50.59 .48	81.0 2.9	54.29 .12	54.5 1.7	42.64 .10	62.4 0.8	11.57 .11	15.1 0.7
16.1	50.16 .38	77.9 3.3	54.18 .09	52.6 2.0	42.55 .07	61.4 1.1	11.47 .08	14.3 0.9
26.1	49.83 −.27	74.5 −3.5	54.11 −.04	50.5 −2.3	42.49 −.03	60.2 −1.3	11.42 −.04	13.2 −1.2
Nov. 5.0	49.62 .15	70.9 3.7	54.10 +.01	48.0 2.6	42.49 +.02	58.8 1.5	11.40 +.01	11.9 1.4
15.0	49.54 −.01	67.1 3.8	54.13 .06	45.3 2.8	42.53 .07	57.2 1.8	11.44 .06	10.4 1.6
25.0	49.59 +.12	63.2 3.8	54.22 .11	42.4 2.9	42.62 .12	55.3 1.9	11.52 .11	8.7 1.8
Dec. 4.9	49.79 .26	59.4 3.7	54.36 .16	39.4 3.0	42.76 .16	53.3 2.1	11.66 .16	6.8 2.0
14.9	50.11 +.39	55.7 −3.5	54.55 +.21	36.4 −3.0	42.94 +.20	51.1 −2.2	11.84 +.20	4.7 −2.1
24.9	50.56 .51	52.3 3.2	54.78 .26	33.4 2.9	43.17 .24	48.9 2.2	12.06 .24	2.6 2.1
34.9	51.12 +.61	49.2 −2.8	55.06 +.30	30.6 −2.7	43.43 +.27	46.7 −2.2	12.32 +.27	0.5 −2.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Ursæ Minoris.		ε Coronæ Borealis.		δ Scorpii.		β¹ Scorpii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 15 47	+78° 8′	h m 15 52	+27° 12′	h m 15 53	−22° 17′	h m 15 58	−19° 29′
	s	″	s	″	s	″	s	″
(Dec. 30.9)	60.67 +.68	25.3 −3.1	52.91 +.25	21.8 −2.8	37.58 +.28	44.6 −0.8	50.45 +.27	31.4 −0.9
Jan. 9.9	61.44 .84	22.4 2.6	53.18 .28	19.0 2.6	37.87 .30	45.5 1.0	50.73 .29	32.4 1.0
19.8	62.36 .97	20.0 2.1	53.47 .30	16.6 2.3	38.18 .32	46.6 1.1	51.04 .31	33.5 1.1
29.8	63.38 1.06	18.2 1.5	53.79 .32	14.5 1.9	38.51 .33	47.7 1.1	51.36 .32	34.6 1.2
Feb. 8.8	64.47 1.11	17.0 0.9	54.11 .32	12.9 1.4	38.84 .33	48.8 1.2	51.68 .32	35.8 1.2
18.7	65.60 +1.12	16.4 −0.2	54.43 +.32	11.7 −0.9	39.16 +.32	50.0 −1.1	52.00 +.32	37.0 −1.1
28.7	66.71 1.09	16.5 +0.4	54.74 .30	11.1 −0.4	39.48 .31	51.1 1.1	52.31 .30	38.0 1.0
Mar. 10.7	67.78 1.02	17.3 1.1	55.04 .29	11.0 +0.1	39.78 .29	52.2 1.0	52.61 .29	39.0 0.9
20.7	68.76 .92	18.7 1.7	55.31 .26	11.4 0.7	40.06 .27	53.1 0.9	52.89 .27	39.9 0.8
30.6	69.62 .79	20.7 2.2	55.56 .24	12.3 1.1	40.32 .25	54.0 0.8	53.14 .25	40.6 0.7
Apr. 9.6	70.34 +.64	23.1 +2.6	55.79 +.21	13.6 +1.5	40.56 +.22	54.7 −0.7	53.38 +.22	41.2 −0.5
19.6	70.91 .47	25.8 2.9	55.98 .18	15.3 1.8	40.77 .20	55.4 0.6	53.59 .20	41.7 0.4
29.6	71.29 .29	28.9 3.1	56.14 .14	17.2 2.1	40.96 .17	55.9 0.5	53.78 .17	42.1 0.3
May 9.5	71.49 +.11	32.1 3.2	56.27 .11	19.4 2.2	41.11 .14	56.4 0.4	53.94 .14	42.3 0.2
19.5	71.50 −.08	35.3 3.2	56.36 .08	21.7 2.3	41.23 .11	56.8 0.3	54.06 .11	42.5 0.2
29.5	71.34 −.25	38.4 +3.0	56.42 +.04	24.0 +2.3	41.33 +.08	57.1 −0.3	54.16 +.08	42.7 −0.1
June 8.4	71.00 .42	41.3 2.8	56.44 .00	26.2 2.2	41.39 .04	57.3 0.2	54.22 .05	42.8 0.0
18.4	70.50 .57	44.0 2.5	56.43 −.03	28.4 2.1	41.41 +.01	57.5 0.2	54.25 +.01	42.8 0.0
28.4	69.86 .71	46.3 2.1	56.38 .07	30.4 1.9	41.40 −.03	57.7 −0.1	54.25 −.02	42.8 0.0
July 8.4	69.08 .83	48.3 1.7	56.30 .10	32.1 1.6	41.35 .06	57.7 0.0	54.21 .06	42.7 +0.1
18.3	68.20 −.93	49.8 +1.2	56.18 −.13	33.6 +1.3	41.27 −.09	57.7 0.0	54.13 −.09	42.6 +0.1
28.3	67.22 1.01	50.8 0.8	56.04 .15	34.8 1.0	41.16 .12	57.6 +0.1	54.03 .12	42.5 0.2
Aug. 7.3	66.19 1.06	51.3 +0.3	55.87 .18	35.6 0.7	41.03 .15	57.5 0.2	53.89 .14	42.3 0.2
17.3	65.11 1.09	51.3 −0.3	55.69 .19	36.1 +0.3	40.87 .16	57.2 0.3	53.74 .16	42.0 0.3
27.2	64.01 1.09	50.8 0.8	55.49 .20	36.2 −0.1	40.70 .17	56.9 0.3	53.57 .17	41.8 0.3
Sept. 6.2	62.93 −1.07	49.7 −1.3	55.29 −.20	36.0 −0.4	40.52 −.18	56.6 +0.4	53.40 −.17	41.4 +0.3
16.2	61.88 1.02	48.2 1.8	55.10 .19	35.3 0.8	40.35 .17	56.1 0.4	53.22 .17	41.1 0.4
26.1	60.90 .94	46.2 2.2	54.91 .17	34.3 1.2	40.19 .15	55.7 0.5	53.06 .15	40.7 0.4
Oct. 6.1	60.00 .84	43.7 2.6	54.75 .14	32.9 1.6	40.05 .12	55.2 0.5	52.93 .12	40.4 0.3
16.1	59.22 .71	40.9 3.0	54.62 .11	31.2 1.9	39.95 .08	54.8 0.4	52.82 .08	40.0 0.3
26.1	58.58 −.56	37.7 −3.3	54.53 −.07	29.1 −2.2	39.89 −.04	54.4 +0.3	52.76 −.04	39.8 +0.2
Nov. 5.0	58.10 .39	34.2 3.6	54.49 −.02	26.8 2.5	39.88 +.01	54.1 +0.2	52.74 +.01	39.7 0.0
15.0	57.80 .20	30.5 3.7	54.50 +.03	24.1 2.7	39.92 .06	54.0 0.0	52.78 .06	39.8 −0.1
25.0	57.69 −.01	26.7 3.8	54.56 .09	21.3 2.9	40.01 .12	54.1 −0.2	52.87 .11	40.0 0.3
Dec. 5.0	57.78 +.19	22.9 3.8	54.67 .14	18.3 3.0	40.16 .17	54.3 0.3	53.01 .16	40.4 0.5
14.9	58.08 +.39	19.2 −3.6	54.84 +.19	15.3 −3.0	40.36 +.22	54.8 −0.5	53.19 +.21	41.0 −0.7
24.9	58.57 .58	15.7 3.3	55.05 .23	12.3 2.9	40.60 .26	55.4 0.8	53.43 .25	41.8 0.9
34.9	59.24 +.76	12.6 −3.0	55.30 +.26	9.4 −2.8	40.88 +.29	56.3 −0.9	53.69 +.26	42.7 −1.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombridge 2320.		δ Ophiuchi.		τ Herculis.		α Scorpii. (*Antares.*)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 16 5	° ′ +68 6	h m 16 8	° ′ − 3 24	h m 16 16	° ′ +46 34	h m 16 22	° ′ −26 10
	s	″	s	″	s	″	s	″
(Dec. 30.9)	57.17 +.39	25.7 −3.3	23.86 +.24	1.1 −1.7	18.50 +.26	57.4 −3.3	27.01 +.26	36.4 −0.4
Jan. 9.9	57.60 .48	22.5 2.9	24.11 .27	2.8 1.7	18.78 .30	54.3 3.0	27.29 .29	36.9 0.6
19.8	58.12 .55	19.8 2.4	24.40 .29	4.4 1.6	19.11 .34	51.5 2.6	27.60 .32	37.6 0.7
29.8	58.70 .60	17.6 1.9	24.69 .30	6.0 1.5	19.46 .36	49.1 2.1	27.92 .33	38.4 0.8
Feb. 8.8	59.33 .63	16.0 1.3	24.99 .30	7.4 1.3	19.83 .38	47.3 1.5	28.25 .33	39.2 0.9
18.8	59.97 +.64	15.1 −0.6	25.29 +.30	8.6 −1.1	20.22 +.38	46.0 −0.9	28.58 +.33	40.1 −0.9
28.7	60.61 .63	14.9 +0.1	25.59 .29	9.5 0.8	20.60 .38	45.4 −0.3	28.91 .32	41.1 0.9
Mar. 10.7	61.24 .60	15.3 0.8	25.87 .27	10.2 0.6	20.97 .36	45.5 +0.3	29.23 .31	42.0 0.9
20.7	61.82 .56	16.4 1.4	26.14 .26	10.7 −0.3	21.32 .34	46.1 0.9	29.54 .30	42.8 0.8
30.7	62.35 .49	18.1 1.9	26.38 .24	10.8 0.0	21.64 .31	47.4 1.5	29.82 .28	43.6 0.8
Apr. 9.6	62.81 +.42	20.3 +2.4	26.61 +.22	10.7 +0.2	21.93 +.27	49.1 +2.0	30.09 +.25	44.3 −0.7
19.6	63.18 .33	22.9 2.8	26.81 .19	10.4 0.4	22.18 .23	51.3 2.4	30.33 .23	45.0 0.6
29.6	63.47 .24	25.8 3.0	26.99 .17	9.9 0.6	22.39 .18	53.9 2.7	30.55 .20	45.6 0.6
May 9.5	63.66 .14	29.0 3.2	27.15 .14	9.2 0.7	22.55 .14	56.7 2.9	30.74 .17	46.1 0.6
19.5	63.75 +.04	32.2 3.2	27.27 .11	8.5 0.8	22.66 .09	59.6 3.0	30.90 .14	46.6 0.5
29.5	63.75 −.05	35.4 +3.1	27.36 +.08	7.6 +0.8	22.72 +.04	62.6 +3.0	31.02 +.11	47.1 −0.5
June 8.5	63.65 .14	38.5 3.0	27.43 .05	6.8 0.9	22.74 −.01	65.5 2.9	31.11 .07	47.6 0.4
18.4	63.46 .23	41.4 2.8	27.46 +.01	5.9 0.8	22.70 .06	68.3 2.7	31.17 +.03	48.0 0.4
28.4	63.18 .31	44.0 2.4	27.46 −.02	5.1 0.8	22.62 .11	70.9 2.4	31.18 .00	48.3 0.3
July 8.4	62.83 .39	46.3 2.0	27.42 .05	4.4 0.7	22.49 .15	73.2 2.1	31.16 −.04	48.6 0.3
18.4	62.40 −.45	48.1 +1.6	27.35 −.08	3.7 +0.6	22.32 −.19	75.1 +1.8	31.10 −.08	48.8 −0.2
28.3	61.92 .50	49.5 1.1	27.25 .11	3.1 0.6	22.11 .22	76.6 1.3	31.00 .11	49.0 −0.1
Aug. 7.3	61.40 .54	50.4 0.6	27.13 .13	2.5 0.5	21.87 .25	77.7 0.9	30.87 .14	49.0 0.0
17.3	60.84 .57	50.8 +0.1	26.98 .15	2.1 0.4	21.61 .27	78.4 +0.4	30.71 .17	49.0 +0.1
27.2	60.26 .58	50.6 −0.4	26.82 .16	1.8 0.2	21.33 .29	78.7 0.0	30.53 .18	48.8 0.2
Sept. 6.2	59.67 −.58	50.0 −0.9	26.66 −.17	1.7 +0.1	21.04 −.29	78.4 −0.5	30.35 −.19	48.6 +0.3
16.2	59.10 .56	48.8 1.4	26.49 .16	1.6 0.0	20.75 .28	77.6 1.0	30.16 .18	48.2 0.4
26.2	58.55 .52	47.1 1.9	26.33 .15	1.7 −0.2	20.48 .26	76.4 1.5	29.98 .17	47.8 0.5
Oct. 6.1	58.05 .47	45.0 2.4	26.20 .12	1.9 0.3	20.22 .23	74.7 1.9	29.82 .14	47.3 0.5
16.1	57.61 .40	42.4 2.8	26.09 .09	2.3 0.5	20.01 .20	72.6 2.3	29.69 .11	46.8 0.5
26.1	57.24 −.32	39.4 −3.1	26.02 −.05	3.0 −0.7	19.83 −.15	70.0 −2.7	29.61 −.07	46.3 +0.5
Nov. 5.1	56.97 .22	36.1 3.4	25.99 −.01	3.8 0.9	19.71 .09	67.1 3.0	29.56 −.02	45.8 0.4
15.0	56.80 .12	32.5 3.7	26.00 +.04	4.7 1.1	19.65 −.03	63.9 3.3	29.58 +.04	45.5 0.3
25.0	56.73 −.01	28.8 3.8	26.07 .09	5.9 1.3	19.65 +.03	60.5 3.5	29.64 .09	45.2 +0.2
Dec. 5.0	56.78 +.11	24.9 3.8	26.19 .14	7.3 1.5	19.72 .10	56.9 3.6	29.76 .15	45.2 0.0
14.9	56.95 +.22	21.1 −3.7	26.35 +.18	8.9 −1.6	19.86 +.17	53.3 −3.6	29.94 +.20	45.2 −0.2
24.9	57.23 .33	17.4 3.5	26.56 .22	10.5 1.7	20.05 .22	49.8 3.5	30.16 .24	45.5 0.4
34.9	57.61 +.43	14.0 −3.2	26.80 +.26	12.2 −1.7	20.31 +.28	46.4 −3.2	30.42 +.28	46.0 −0.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Draconis.		β Herculis.		A Draconis.		ζ Ophiuchi.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 16 22	° ′ +61 45	h m 16 25	° ′ +21 44	h m 16 28	° ′ +69 0	h m 16 30	° ′ −10 20
	s	″	s	″	s	″	s	″
(Dec.30.9)	24.86 +.30	70.9 −3.5	20.00 +.23	15.0 −2.7	8.80 +.35	43.3 −3.5	54.53 +.23	5.1 −1.2
Jan. 9.9	25.21 .37	67.6 3.1	20.24 .25	12.3 2.5	9.20 .44	40.0 3.1	54.77 .26	6.3 1.3
19.9	25.61 .43	64.8 2.6	20.51 .28	9.9 2.3	9.69 .53	37.1 2.7	55.05 .28	7.6 1.3
29.8	26.07 .48	62.3 2.1	20.80 .30	7.8 2.0	10.26 .59	34.7 2.1	55.34 .30	8.9 1.2
Feb. 8.8	26.57 .51	60.5 1.5	21.10 .30	6.0 1.5	10.88 .64	32.8 1.5	55.64 .30	10.1 1.1
18.8	27.09 +.52	59.3 −0.8	21.40 +.31	4.7 −1.0	11.53 +.66	31.7 −0.9	55.94 +.30	11.1 −1.0
28.7	27.61 .52	58.8 −0.2	21.71 .30	3.8 0.6	12.20 .66	31.1 −0.2	56.25 .30	12.0 0.8
Mar. 10.7	28.12 .50	59.0 +0.5	22.01 .29	3.5 −0.1	12.86 .64	31.3 +0.5	56.54 .29	12.7 0.6
20.7	28.60 .47	59.8 1.1	22.29 .27	3.6 +0.4	13.48 .60	32.1 1.1	56.82 .27	13.3 0.4
30.7	29.05 .42	61.2 1.7	22.55 .25	4.2 0.8	14.06 .54	33.6 1.7	57.08 .26	13.6 −0.2
Apr. 9.6	29.44 +.37	63.2 +2.2	22.79 +.23	5.3 +1.2	14.56 +.47	35.6 +2.2	57.33 +.24	13.7 0.0
19.6	29.78 .30	65.7 2.6	23.01 .20	6.7 1.6	15.00 .39	38.0 2.6	57.56 .21	13.6 +0.1
29.6	30.05 .23	68.4 2.9	23.20 .17	8.4 1.8	15.35 .30	40.8 2.9	57.76 .19	13.4 0.3
May 9.6	30.25 .16	71.5 3.1	23.36 .14	10.3 2.0	15.60 .20	43.9 3.1	57.94 .16	13.0 0.4
19.5	30.37 .09	74.7 3.2	23.48 .11	12.4 2.1	15.74 +.10	47.1 3.2	58.09 .14	12.6 0.5
29.5	30.43 +.01	77.9 +3.2	23.57 +.08	14.5 +2.1	15.79 .00	50.4 +3.2	58.21 +.10	12.1 +0.5
June 8.5	30.40 −.06	81.0 3.1	23.63 +.04	16.7 2.1	15.73 −.10	53.6 3.1	58.30 .07	11.6 0.5
18.4	30.30 .13	84.0 2.9	23.66 .00	18.8 2.0	15.58 .20	56.6 2.9	58.35 +.04	11.0 0.5
28.4	30.13 .20	86.8 2.6	23.64 −.03	20.7 1.9	15.33 .29	59.4 2.6	58.37 .00	10.5 0.5
July 8.4	29.90 .26	89.2 2.3	23.59 .07	22.5 1.7	14.99 .37	61.9 2.3	58.36 −.03	10.1 0.5
18.4	29.61 −.32	91.3 +1.8	23.51 −.10	24.1 +1.4	14.58 −.45	63.9 +1.9	58.30 −.07	9.6 +0.4
28.3	29.26 .37	92.9 1.4	23.39 .13	25.4 1.1	14.10 .51	65.6 1.4	58.22 .10	9.2 0.4
Aug. 7.3	28.88 .40	94.1 0.9	23.25 .16	26.4 0.9	13.56 .56	66.8 0.9	58.10 .13	8.8 0.3
17.3	28.45 .43	94.8 +0.4	23.08 .18	27.1 0.6	12.98 .59	67.5 +0.4	57.96 .15	8.5 0.2
27.3	28.01 .45	94.9 −0.1	22.89 .19	27.5 +0.2	12.37 .62	67.7 −0.1	57.80 .17	8.3 0.2
Sept. 6.2	27.55 −.45	94.6 −0.6	22.70 −.19	27.5 −0.1	11.75 −.62	67.4 −0.6	57.63 −.17	8.1 +0.2
16.2	27.10 .44	93.7 1.1	22.50 .19	27.2 0.5	11.13 .61	66.5 1.1	57.46 .17	7.9 +0.1
26.2	26.67 .42	92.3 1.6	22.31 .18	26.5 0.8	10.53 .58	65.1 1.6	57.29 .16	7.9 0.0
Oct. 6.1	26.26 .38	90.5 2.1	22.15 .16	25.5 1.2	9.97 .53	63.3 2.1	57.14 .14	7.9 −0.1
16.1	25.91 .33	88.1 2.5	22.00 .13	24.2 1.5	9.46 .47	60.9 2.6	57.02 .11	8.0 0.2
26.1	25.61 −.26	85.4 −2.9	21.89 −.09	22.5 −1.8	9.03 −.39	58.2 −2.9	56.93 −.07	8.2 −0.3
Nov. 5.1	25.38 .19	82.2 3.3	21.82 −.04	20.5 2.1	8.68 .30	55.0 3.3	56.88 −.02	8.6 0.5
15.0	25.23 .11	78.8 3.5	21.81 .00	18.2 2.4	8.44 .19	51.6 3.5	56.88 +.03	9.2 0.6
25.0	25.16 −.02	75.2 3.7	21.84 +.06	15.8 2.6	8.30 −.08	47.9 3.7	56.93 .08	9.9 0.8
Dec. 5.0	25.19 +.07	71.4 3.8	21.92 .11	13.1 2.7	8.29 +.05	44.1 3.8	57.04 .13	10.8 1.0
15.0	25.31 +.17	67.6 −3.8	22.05 +.16	10.3 −2.8	8.39 +.16	40.3 −3.8	57.19 +.17	11.9 −1.1
24.9	25.53 .25	63.9 3.6	22.23 .20	7.5 2.8	8.62 .28	36.6 3.6	57.38 .21	13.0 1.2
34.9	25.82 +.33	60.3 −3.4	22.45 +.24	4.7 −2.7	8.95 +.39	33.1 −3.4	57.61 +.25	14.3 −1.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Trianguli Australis.		η Herculis.		κ Ophiuchi.		d Herculis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$16^{h}\ 36^{m}$	$-68^{\circ}\ 48'$	$16^{h}\ 38^{m}$	$+39^{\circ}\ 8'$	$16^{h}\ 52^{m}$	$+\ 9^{\circ}\ 33'$	$16^{h}\ 57^{m}$	$+33^{\circ}\ 43'$
	s	″	s	″	s	″	s	″
(Dec.30.9)	38.71 +.53	48.0 +1.8	59.28 +.22	17.1 −3.2	17.46 +.20	11.4 −2.2	24.10 +.19	59.9 −3.1
Jan. 9.9	39.28 .61	46.3 1.4	59.52 .26	14.0 3.0	17.68 .23	9.2 2.1	24.31 .23	56.9 2.9
19.8	39.92 .67	45.1 1.0	59.80 .29	11.2 2.7	17.92 .26	7.2 2.0	24.57 .27	54.1 2.6
29.8	40.62 .72	44.3 0.6	60.11 .32	8.7 2.2	18.19 .28	5.3 1.7	24.85 .29	51.6 2.3
Feb. 8.8	41.36 .75	43.9 +0.2	60.44 .34	6.7 1.7	18.47 .29	3.7 1.5	25.16 .31	49.5 1.8
18.8	42.11 +.76	43.9 −0.2	60.78 +.34	5.3 −1.1	18.76 +.29	2.4 −1.1	25.48 +.32	48.0 −1.3
28.7	42.87 .75	44.3 0.6	61.13 .34	4.4 −0.6	19.06 .29	1.5 0.8	25.80 .32	47.0 0.7
Mar. 10.7	43.62 .73	45.1 0.9	61.47 .33	4.1 0.0	19.34 .28	0.9 −0.4	26.13 .32	46.5 −0.1
20.7	44.34 .70	46.3 1.3	61.80 .32	4.5 +0.6	19.62 .27	0.8 0.0	26.44 .31	46.6 +0.4
30.7	45.03 .66	47.7 1.6	62.10 .29	5.4 1.2	19.89 .26	1.0 +0.4	26.74 .29	47.3 1.0
Apr. 9.6	45.66 +.61	49.6 −1.8	61.38 +.27	6.8 +1.7	20.14 +.24	1.6 +0.8	27.02 +.27	48.6 +1.5
19.6	46.24 .55	51.7 2.2	62.63 .23	8.7 2.1	20.37 .22	2.5 1.1	27.28 .24	50.2 1.9
29.6	46.76 .48	54.0 2.4	62.85 .20	11.0 2.4	20.58 .20	3.7 1.3	27.50 .21	52.3 2.2
May 9.5	47.20 .40	56.4 2.5	63.03 .16	13.5 2.6	20.76 .17	5.1 1.5	27.70 .18	54.6 2.4
19.5	47.55 .31	59.0 2.6	63.17 .12	16.2 2.8	20.92 .14	6.7 1.6	27.86 .14	57.2 2.6
29.5	47.82 +.22	61.6 −2.6	63.27 +.08	19.1 +2.8	21.04 +.11	8.3 +1.6	27.98 +.10	59.8 +2.7
June 8.5	48.00 .12	64.2 2.6	63.32 +.03	21.9 2.8	21.14 .08	10.0 1.6	28.06 .06	62.5 2.7
18.4	48.07 +.02	66.8 2.5	63.33 −.01	24.6 2.7	21.20 .04	11.6 1.6	28.09 +.02	65.2 2.6
28.4	48.04 −.07	69.3 2.4	63.30 .06	27.2 2.5	21.22 +.01	13.2 1.5	28.09 −.03	67.7 2.4
July 8.4	47.92 .17	71.6 2.2	63.22 .10	29.5 2.2	21.21 −.03	14.6 1.4	28.04 .07	70.0 2.2
18.4	47.70 −.27	73.7 −1.9	63.10 −.14	31.6 +1.9	21.16 −.07	15.9 +1.2	27.95 −.11	72.1 +1.9
28.3	47.39 .35	75.4 1.6	62.94 .17	33.3 1.5	21.07 .10	17.0 1.0	27.83 .14	73.9 1.6
Aug. 7.3	47.00 .42	76.8 1.2	62.75 .20	34.6 1.1	20.96 .13	17.9 0.8	27.66 .18	75.3 1.3
17.3	46.55 .47	77.7 0.7	62.53 .23	35.5 0.7	20.81 .15	18.6 0.6	27.47 .20	76.4 0.9
27.2	46.05 .51	78.3 −0.3	62.29 .25	36.0 +0.3	20.65 .17	19.1 0.3	27.26 .22	77.0 +0.5
Sept. 6.2	45.53 −.53	78.3 +0.2	62.04 −.25	36.0 −0.2	20.47 −.18	19.3 +0.1	27.03 −.23	77.3 0.0
16.2	45.00 .52	77.9 0.7	61.79 .25	35.6 0.6	20.29 .18	19.3 −0.1	26.79 .23	77.1 −0.4
26.2	44.49 .48	77.0 1.1	61.54 .24	34.7 1.1	20.11 .17	19.0 0.4	26.56 .23	76.5 0.8
Oct. 6.1	44.03 .43	75.6 1.5	61.31 .22	33.4 1.5	19.94 .16	18.5 0.7	26.34 .21	75.5 1.3
16.1	43.64 .35	73.8 1.9	61.10 .19	31.7 1.9	19.80 .13	17.6 0.9	26.14 .18	74.0 1.7
26.1	43.34 −.25	71.8 +2.2	60.94 −.14	29.5 −2.3	19.68 −.10	16.6 −1.2	25.98 −.14	72.2 −2.0
Nov. 5.1	43.14 .14	69.5 2.4	60.82 .09	27.0 2.7	19.61 .05	15.2 1.5	25.86 .10	69.9 2.4
15.0	43.06 −.02	67.0 2.5	60.75 −.04	24.2 3.0	19.58 −.01	13.6 1.7	25.78 −.05	67.4 2.7
25.0	43.11 +.11	64.5 2.5	60.74 +.02	21.0 3.2	19.59 +.04	11.9 1.9	25.76 +.01	64.5 2.9
Dec. 5.0	43.29 .24	62.0 2.4	60.79 .08	17.7 3.4	19.65 .09	9.8 2.1	25.79 .06	61.5 3.1
14.9	43.59 +.36	59.7 +2.2	60.89 +.14	14.3 −3.4	19.77 +.14	7.7 −2.2	25.88 +.12	58.3 −3.2
24.9	44.00 .47	57.6 1.9	61.06 .19	10.9 3.3	19.93 .18	5.5 2.2	26.02 .17	55.1 3.2
34.9	44.52 +.57	55.8 +1.6	61.27 +.24	7.6 −3.2	20.12 +.22	3.3 −2.1	26.21 +.21	51.9 −3.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*ε* Ursæ Minoris.		*α*¹ Herculis.		*b* Ophiuchi.		*β* Draconis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 16 57	° ′ +82 13	h m 17 9	° ′ +14 31	h m 17 19	° ′ −24 4	h m 17 27	° ′ +52 22
	s	″	s	″	s	″	s	″
(Dec. 30.9)	25.39+ .53	18.9 −3.4	27.92 +.18	17.1 −2.4	26.20 +.21	2.8 −0.2	50.36 +.16	70.2 −3.6
Jan. 9.9	26.08 .82	15.6 3.2	28.12 .22	14.7 2.3	26.43 .24	3.1 0.3	50.55 .23	66.7 3.3
19.9	27.04 1.09	12.6 2.8	28.35 .25	12.5 2.1	26.69 .27	3.5 0.4	50.81 .28	63.4 3.1
29.8	28.24 1.30	10.0 2.3	28.61 .27	10.4 1.9	26.98 .30	4.0 0.5	51.12 .33	60.5 2.7
Feb. 8.8	29.64 1.47	8.0 1.7	28.89 .28	8.7 1.6	27.28 .31	4.5 0.5	51.47 .36	58.0 2.2
18.8	31.18+1.58	6.6 −1.2	29.18 +.29	7.3 −1.2	27.60 +.32	5.0 −0.5	51.85 +.39	56.1 −1.6
28.8	32.81 1.64	5.8 −0.5	29.47 .29	6.3 0.8	27.92 .32	5.5 0.5	52.25 .40	54.8 1.0
Mar. 10.7	34.46 1.63	5.6 +0.2	29.76 .29	5.8 −0.3	28.24 .32	5.9 0.4	52.66 .41	54.2 −0.3
20.7	36.07 1.56	6.2 0.8	30.04 .28	5.6 +0.1	28.55 .31	6.3 0.4	53.06 .40	54.2 +0.3
30.7	37.59 1.44	7.3 1.4	30.32 .27	5.9 0.5	28.86 .30	6.6 0.3	53.46 .38	54.8 1.0
Apr. 9.6	38.96+1.28	9.0 +1.9	30.58 +.25	6.6 +0.9	29.16 +.29	6.9 −0.2	53.83 +.36	56.1 +1.5
19.6	40.14 1.07	11.2 2.4	30.82 .23	7.7 1.2	29.43 .27	7.1 0.2	54.18 .33	57.9 2.0
29.6	41.10 .83	13.8 2.7	31.04 .21	9.1 1.5	29.69 .25	7.3 0.2	54.49 .29	60.2 2.5
May 9.6	41.80 .56	16.7 3.0	31.24 .18	10.7 1.7	29.93 .22	7.4 0.1	54.75 .24	62.8 2.8
19.5	42.23+ .29	19.7 3.1	31.41 .15	12.5 1.9	30.14 .20	7.6 0.1	54.96 .19	65.8 3.0
29.5	42.37 .00	22.9 +3.2	31.55 +.12	14.4 +1.9	30.32 +.16	7.7 −0.1	55.12 +.13	68.9 +3.2
June 8.5	42.24− .27	26.1 3.1	31.66 .09	16.4 1.9	30.47 .13	7.9 0.2	55.22 .07	72.1 3.2
18.5	41.83 .54	29.1 3.0	31.73 .05	18.3 1.9	30.58 .09	8.0 0.2	55.27 +.01	75.3 3.1
28.4	41.15 .80	32.0 2.8	31.76 +.01	20.2 1.8	30.65 .05	8.2 0.2	55.25 −.05	78.3 3.0
July 8.4	40.23 1.03	34.7 2.4	31.76 −.02	21.9 1.6	30.68 +.01	8.4 0.2	55.17 .11	81.2 2.8
18.4	39.09−1.23	36.9 +2.1	31.72 −.06	23.4 +1.4	30.66 −.04	8.7 −0.2	55.04 −.16	83.9 +2.5
28.3	37.76 1.41	38.8 1.7	31.64 .10	24.8 1.2	30.60 .08	8.9 0.2	54.85 .21	86.2 2.1
Aug. 7.3	36.27 1.56	40.2 1.2	31.53 .13	25.9 1.0	30.51 .11	9.1 0.2	54.62 .26	88.1 1.7
17.3	34.65 1.67	41.2 0.8	31.38 .15	26.8 0.7	30.38 .14	9.2 0.1	54.34 .30	89.7 1.3
27.3	32.93 1.74	41.7 +0.3	31.22 .17	27.4 0.5	30.22 .17	9.3 −0.1	54.02 .33	90.7 0.8
Sept. 6.2	31.17−1.78	41.7 −0.3	31.04 −.19	27.7 +0.2	30.04 −.18	9.3 0.0	53.68 −.34	91.3 +0.3
16.2	29.38 1.77	41.2 0.8	30.84 .19	27.7 −0.1	29.85 .19	9.3 +0.1	53.33 .35	91.4 −0.2
26.2	27.63 1.72	40.2 1.2	30.65 .18	27.4 0.4	29.66 .19	9.1 0.2	52.98 .35	91.0 0.7
Oct. 6.2	25.94 1.63	38.7 1.7	30.48 .17	26.9 0.7	29.48 .17	8.9 0.2	52.63 .33	90.1 1.2
16.1	24.37 1.50	36.8 2.2	30.32 .14	26.0 1.0	29.32 .14	8.7 0.2	52.31 .30	88.7 1.7
26.1	22.94−1.32	34.4 −2.6	30.19 −.11	24.8 −1.3	29.19 −.11	8.5 +0.2	52.02 −.26	86.7 −2.1
Nov. 5.1	21.72 1.11	31.6 2.9	30.09 .07	23.3 1.6	29.10 .07	8.2 0.2	51.78 .22	84.4 2.6
15.0	20.73 .86	28.4 3.3	30.04 −.03	21.6 1.9	29.05 −.02	8.0 0.2	51.59 .15	81.6 2.9
25.0	20.00 .58	25.0 3.5	30.03 +.02	19.6 2.1	29.06 +.03	7.9 +0.1	51.47 .09	78.5 3.3
Dec. 5.0	19.56− .26	21.5 3.6	30.07 .07	17.4 2.3	29.12 .09	7.8 0.0	51.42 −.02	75.1 3.5
15.0	19.43+ .04	17.8 −3.6	30.17 +.12	15.1 −2.4	29.24 +.14	7.8 −0.1	51.43 +.05	71.5 −3.6
24.9	19.62 .34	14.2 3.6	30.31 .16	12.6 2.4	29.40 .18	8.0 0.2	51.52 .12	67.9 3.6
34.9	20.11+ .64	10.7 −3.4	30.49 +.20	10.2 −2.4	29.61 +.23	8.3 −0.3	51.68 +.19	64.3 −3.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ophiuchi.		ω Draconis.		μ Herculis.		ψ^1 Draconis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$17^{h}\ 29^{m}$	$+12^{\circ}\ 38'$	$17^{h}\ 37^{m}$	$+68^{\circ}\ 48'$	$17^{h}\ 42^{m}$	$+27^{\circ}\ 47'$	$17^{h}\ 43^{m}$	$+72^{\circ}\ 12'$
	s	″	s	″	s	″	s	″
Jan. 0.0	39.54 +.16	40.9 −2.3	33.14 +.16	39.7 −3.7	0.30 +.14	19.3 −2.9	52.63 +.15	18.2 −3.7
9.9	39.73 .20	38.6 2.2	33.36 .28	36.1 3.5	0.46 .19	16.4 2.8	52.85 .29	14.6 3.5
19.9	39.94 .28	36.5 2.1	33.69 .38	32.8 3.2	0.67 .22	13.7 2.6	53.20 .41	11.2 3.2
29.9	40.19 .25	34.5 1.9	34.12 .47	29.8 2.8	0.90 .25	11.2 2.3	53.67 .52	8.1 2.8
Feb. 8.8	40.45 .27	32.8 1.6	34.62 .54	27.2 2.3	1.17 .28	9.0 2.0	54.24 .61	5.5 2.4
18.8	40.73 +.28	31.4 −1.2	35.20 +.60	25.2 −1.7	1.46 +.29	7.2 −1.5	54.90 +.68	3.4 −1.8
28.8	41.02 .29	30.3 0.8	35.82 .63	23.8 1.1	1.75 .30	6.0 1.0	55.61 .73	2.0 1.1
Mar. 10.8	41.31 .29	29.7 −0.4	36.46 .64	23.1 −0.4	2.06 .30	5.2 −0.5	56.35 .75	1.2 −0.5
20.7	41.59 .28	29.5 0.0	37.11 .64	23.0 +0.3	2.36 .30	5.0 +0.1	57.11 .75	1.0 +0.2
30.7	41.87 .27	29.8 +0.4	37.74 .61	23.6 0.9	2.66 .29	5.3 0.6	57.85 .72	1.5 0.8
Apr. 9.7	42.14 +.26	30.4 +0.8	38.33 +.57	24.9 +1.5	2.95 +.28	6.2 +1.1	58.55 +.67	2.7 +1.4
19.7	42.39 .25	31.4 1.1	38.88 .51	26.7 2.1	3.22 .26	7.5 1.5	59.19 .60	4.4 2.0
29.6	42.63 .22	32.7 1.4	39.36 .44	29.0 2.5	3.48 .24	9.2 1.9	59.76 .52	6.7 2.4
May 9.6	42.84 .20	34.3 1.6	39.76 .36	31.7 2.9	3.70 .21	11.2 2.2	60.23 .42	9.3 2.8
19.6	43.03 .17	36.0 1.8	40.07 .26	34.7 3.1	3.90 .18	13.5 2.4	60.60 .31	12.3 3.1
29.5	43.19 +.14	37.8 +1.9	40.28 +.16	38.0 +3.3	4.07 +.15	16.0 +2.5	60.85 +.19	15.4 +3.2
June 8.5	43.32 .11	39.7 1.9	40.40 +.06	41.3 3.3	4.20 .11	18.5 2.5	60.98 +.07	18.7 3.3
18.5	43.41 .07	41.6 1.9	40.41 −.04	44.6 3.3	4.29 .07	21.1 2.5	60.99 −.05	22.0 3.3
28.5	43.46 +.03	43.4 1.8	40.32 .14	47.9 3.1	4.34 +.03	23.6 2.4	60.88 .17	25.3 3.1
July 8.4	43.48 .00	45.2 1.6	40.13 .24	50.9 2.9	4.34 −.02	25.9 2.3	60.65 .29	28.3 2.9
18.4	43.45 −.04	46.7 +1.5	39.84 −.33	53.7 +2.6	4.30 −.06	28.1 +2.1	60.31 −.40	31.2 +2.7
28.4	43.39 .08	48.1 1.3	39.46 .41	56.2 2.3	4.22 .10	30.0 1.8	59.86 .49	33.7 2.3
Aug. 7.4	43.29 .11	49.2 1.0	39.01 .49	58.3 1.9	4.11 .14	31.7 1.5	59.32 .58	35.8 1.9
17.3	43.16 .14	50.1 0.8	38.49 .55	60.0 1.4	3.95 .17	33.0 1.1	58.70 .65	37.6 1.5
27.3	43.01 .17	50.8 0.5	37.92 .59	61.2 1.0	3.77 .19	34.0 0.8	58.01 .71	38.8 1.0
Sept. 6.3	42.83 −.18	51.2 +0.3	37.30 −.63	61.9 +0.5	3.56 −.21	34.6 +0.4	57.28 −.75	39.6 +0.5
16.2	42.64 .19	51.3 0.0	36.67 .64	62.1 −0.1	3.35 .22	34.8 0.0	56.51 .77	39.9 0.0
26.2	42.45 .19	51.1 −0.3	36.02 .64	61.8 0.6	3.12 .22	34.6 −0.4	55.74 .77	39.7 −0.5
Oct. 6.2	42.27 .18	50.7 0.6	35.39 .62	60.9 1.1	2.90 .21	34.0 0.8	54.97 .75	38.9 1.0
16.2	42.10 .15	49.9 0.9	34.79 .58	59.5 1.6	2.70 .19	33.0 1.2	54.24 .71	37.6 1.6
26.1	41.96 −.12	48.9 −1.2	34.23 −.52	57.7 −2.1	2.52 −.16	31.7 −1.6	53.56 −.64	35.8 −2.0
Nov. 5.1	41.85 .09	47.6 1.4	33.74 .45	55.3 2.6	2.38 .12	29.9 1.9	52.96 .56	33.5 2.5
15.1	41.79 −.04	46.0 1.7	33.34 .36	52.5 3.0	2.28 .08	27.8 2.2	52.44 .46	30.8 2.9
25.1	41.76 .00	44.2 1.9	33.03 .26	49.4 3.3	2.22 −.03	25.4 2.5	52.04 .34	27.7 3.2
Dec. 5.0	41.79 +.05	42.1 2.1	32.83 .14	45.9 3.5	2.21 +.02	22.8 2.7	51.76 .21	24.3 3.5
15.0	41.86 +.10	40.0 −2.2	32.74 −.03	42.3 −3.7	2.26 +.07	19.9 −2.9	51.62 −.07	20.7 −3.7
25.0	41.98 .14	37.7 2.3	32.77 +.09	38.6 3.7	2.35 .12	17.0 3.0	51.61 +.06	17.0 3.7
34.9	42.15 +.18	35.4 −2.3	32.92 +.21	34.9 −3.6	2.49 +.17	14.0 −2.9	51.74 +.21	13.5 −3.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Draconis.		γ² Sagittarii.		μ Sagittarii.		η Serpentis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 17 53	° ′ +51 29	h m 17 58	° ′ −30 25	h m 18 6	° ′ −21 5	h m 18 15	° ′ − 2 55
	s	″	s	″	s	″	s	″
Jan. 0.0	56.55 +.12	73.5 −3.6	30.75 +.18	19.0 +0.3	58.30 +.16	6.6 −0.2	25.90 +.13	30.6 −1.3
9.9	56.70 .19	70.0 3.4	30.95 .22	18.7 0.2	58.48 .20	6.9 0.3	26.05 .17	32.0 1.3
19.9	56.92 .24	66.6 3.2	31.19 .25	18.5 0.2	58.69 .23	7.2 0.3	26.23 .20	33.3 1.3
29.9	57.19 .29	63.6 2.8	31.46 .28	18.4 +0.1	58.93 .26	7.5 0.3	26.44 .23	34.5 1.2
Feb. 8.9	57.51 .33	61.0 2.4	31.75 .30	18.3 0.0	59.20 .28	7.8 0.3	26.68 .25	35.6 1.0
18.8	57.86 +.37	58.8 −1.9	32.07 +.32	18.3 0.0	59.49 +.29	8.1 −0.2	26.94 +.26	36.5 −0.8
28.8	58.24 .39	57.2 1.3	32.39 .33	18.4 0.0	59.79 .30	8.3 0.2	27.21 .28	37.2 0.6
Mar. 10.8	58.63 .40	56.3 −0.6	32.73 .33	18.4 −0.1	60.09 .31	8.4 −0.1	27.49 .28	37.7 −0.3
20.8	59.03 .40	56.0 0.0	33.06 .33	18.5 0.1	60.40 .31	8.4 0 0	27.77 .28	37.8 0.0
30.7	59.43 .39	56.4 +0.7	33.39 .33	18.6 0.1	60.71 .31	8.4 +0.1	28.06 .28	37.7 +0.2
Apr. 9.7	59.81 +.37	57.4 +1.3	33.72 +.32	18.6 −0.1	61.01 +.30	8.2 +0.2	28.34 +.28	37.3 +0.5
19.7	60.17 .34	59.0 1.8	34.04 .31	18.8 0.1	61.31 29	8.0 0.2	28.61 .27	36.7 0.7
29.6	60.50 .31	61.0 2.3	34.34 .29	18.9 0.2	61.59 .27	7.8 0.3	28.88 .26	35.9 0.9
May 9.6	60.79 .27	63.5 2.7	34.62 .27	19.1 0.2	61.86 .26	7.5 0.3	29.12 .24	34.9 1.1
19.6	61.03 .22	66.3 2.9	34.88 .24	19.3 0.3	62.11 .23	7.2 0 3	29.35 .22	33.7 1.2
29.6	61.23 +.17	69.4 +3.1	35.11 +.21	19.6 −0.3	62.33 +.20	7.0 +0.2	29.56 +.19	33.5 +1.2
June 8.5	61.37 .11	72.6 3.2	35.30 .18	19.9 0.4	62.52 .17	6.8 0.2	29.73 .16	31.3 1.2
18.5	61.45 +.05	75.9 3.2	35.46 .13	20.4 0.5	62.67 .13	6.6 +0.1	29.88 .13	30.1 1.2
28.5	61.47 −.01	79.0 3.1	35.57 .09	20.9 0.5	62.78 .09	6.5 0.0	29.98 .09	29.0 1.1
July 8.4	61.43 .07	82.1 2.9	35.64 +.04	21.4 0.6	62.85 .05	6.5 0.0	30.05 .05	27.9 1.0
18.4	61.34 −.13	84.9 +2.7	35.66 .00	22.0 −0.6	62.88 +.01	6.5 −0.1	30.08 +.01	27.0 +0.9
28.4	61.18 .18	87.4 2.4	35.63 −.05	22.5 0.6	62.87 −.04	6.6 0.1	30.06 −.04	26.2 0.8
Aug. 7.4	60.98 .23	89.6 2.0	35.56 .09	23.1 0.5	62.81 .08	6.8 0.2	30.00 .08	25.5 0.6
17.3	60.72 .27	91.5 1.6	35.45 .13	23.6 0.5	62.71 .12	7.0 0.2	29.91 .11	25.0 0.5
27.3	60.43 .31	92.8 1.2	35.30 .16	24.0 0.4	62.57 .15	7.1 0.2	29.78 .14	24.6 0.3
Sept. 6.3	60.11 −.33	93 8 +0.7	35.12 −.19	24.4 −0.3	62.41 −.17	7.3 −0.1	29.63 −.16	24.3 +0.2
16.3	59.77 .35	94.2 +0.2	34.92 .20	24.6 −0.1	62.23 .18	7.4 0.1	29.46 .18	24.2 0.0
26.2	59.42 .35	94.1 −0.3	34.71 .20	24.7 0.0	62.04 .19	7.5 −0.1	29.28 .18	24.2 −0.1
Oct. 6.2	59.07 .34	93.6 0.8	34.51 .20	24.6 +0.1	61.85 .18	7.6 0.0	29.10 .18	24.4 0.3
16.2	58.74 .31	92.5 1.3	34.32 .18	24.4 0.2	61.68 .16	7.6 0.0	28.93 .16	24.8 0.4
26.1	58.44 −.28	90.9 −1.8	34.16 −.14	24.1 +0.3	61.52 −.14	7.6 0.0	28.77 −.14	25.3 −0.6
Nov. 5.1	58.18 .24	88.8 2.3	34.03 .10	23.7 0.4	61.40 .10	7.6 0.0	28.65 .11	25.9 0.7
15.1	57.97 .18	86.3 2.7	33.95 .06	23.2 0.5	61.32 .06	7.6 0.0	28.56 .07	26.7 0.9
25.1	57.81 .12	83.4 3.0	33.92 −.01	22.8 0.5	61.29 −.01	7.6 0.0	28.52 −.03	27.7 1.0
Dec. 5.0	57.72 −.06	80.2 3.3	33.94 +.05	22.3 0.4	61.30 +.04	7.6 −0.1	28.51 +.02	28.7 1.1
15.0	57.70 +.01	76.8 −3.5	34.02 +.10	21.9 +0.4	61.36 +.09	7.8 −0.2	28.56 +.06	29.9 −1.2
25.0	57.75 .08	73.2 3.6	34.15 .15	21.5 0.3	61.47 .13	8.0 0.2	28.64 .11	31.2 1.3
35.0	57.87 +.15	69.6 −3.6	34.32 +.20	21.2 +0.3	61.63 +.17	8.2 −0.3	28.77 +.15	32.6 −1.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ Octantis.		1 Aquilæ.		α Lyræ. (*Vega.*)		β Lyræ.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h 18	° ′ −89 15	h m 18 29	° ′ − 8 19	h m 18 33	° ′ +38 40	h m 18 45	° ′ +33 13
	m s	″	s	″	s	″	s	″
Jan. 0.0	34 53.0+ 4.7	63.5 +3.3	1.56 +.12	13.6 −1.0	4.77 +.08	50.6 −3.2	52.58 +.07	61.7 −3.0
10.0	34 58.9 7.5	60.3 3.2	1.70 .16	14.6 1.0	4.87 .13	47.4 3.1	52.67 .12	58.7 3.0
19.9	35 8.0 10.5	57.2 3.0	1.88 .19	15.6 0.9	5.03 .18	44.3 3.0	52.81 .16	55.8 2.9
29.9	35 19.7 13.0	54.3 2.7	2.09 .22	16.5 0.8	5.22 .22	41.4 2.8	53.00 .20	53.0 2.6
Feb. 8.9	35 33.9 15.2	51.8 2.4	2.32 .24	17.2 0.7	5.46 .25	38.8 2.4	53.21 .23	50.5 2.3
18.9	35 50.1+17.0	49.6 +2.0	2.58 +.26	17.9 −0.6	5.73 +.28	36.6 −2.0	53.46 +.26	48.4 −1.9
28.8	36 7.8 18.4	47.9 1.5	2.84 .27	18.4 0.4	6.03 .31	34.9 1.4	53.73 .28	46.7 1.4
Mar. 10.8	36 26.7 19.3	46.6 1.0	3.12 .28	18.7 −0.2	6.34 .32	33.7 0.9	54.02 .30	45.5 0.9
20.8	36 46.3 19.8	45.9 +0.5	3.41 .29	18.7 +0.1	6.67 .33	33.1 −0.3	54.33 .31	44.9 −0.3
30.7	37 6.2 19.9	45.6 0.0	3.70 .29	18.5 0.3	7.00 .33	33.1 +0.3	54.65 .32	44.8 +0.2
Apr. 9.7	37 25.9+19.5	45.8 −0.4	3.99 +.29	18.2 +0.5	7.33 +.32	33.8 +0.9	54.96 +.31	45.3 +0.8
19.7	37 45.1 18.8	46.4 0.9	4.27 .28	17.6 0.7	7.66 .31	34.9 1.4	55.27 .30	46.4 1.3
29.7	38 3.3 17.6	47.6 1.4	4.55 .27	16.9 0.8	7.96 .29	36.6 1.9	55.57 .29	47.9 1.7
May 9.6	38 20.2 16.2	49.2 1.8	4.81 .25	16.0 0.9	8.25 .27	38.7 2.3	55.85 .27	49.9 2.1
19.6	38 35.5 14.3	51.1 2.2	5.05 .23	15.1 1.0	8.50 .24	41.1 2.6	56.11 .24	52.2 2.4
29.6	38 48.7+12.1	53.5 −2.5	5.27 +.21	14.1 +1.0	8.73 +.20	43.9 +2.8	56.34 +.21	54.7 +2.7
June 8.6	38 59.6 9.7	56.1 2.8	5.47 .18	13.1 1.0	8.91 .16	46.8 3.0	56.53 .17	57.5 2.8
18.5	39 8.0 7.0	58.9 3.0	5.63 .14	12.1 0.9	9.05 .12	49.8 3.0	56.69 .13	60.3 2.9
28.5	39 13.6 4.2	62.0 3.1	5.75 .10	11.2 0.9	9.14 .07	52.8 3.0	56.80 .09	63.2 2.8
July 8.5	39 16.2+ 1.2	65.1 3.1	5.84 .06	10.4 0.8	9.18 +.02	55.8 2.9	56.86 +.04	66.0 2.7
18.4	39 15.8− 1.9	68.2 −3.1	5.88 +.02	9.7 +0.6	9.18 −.03	58.6 +2.7	56.88 −.01	68.7 +2.6
28.4	39 12.4 4.9	71.2 2.9	5.88 −.02	9.1 0.5	9.12 .08	61.2 2.5	56.84 .06	71.2 2.4
Aug. 7.4	39 6.1 7.7	74.0 2.7	5.84 .06	8.7 0.4	9.01 .13	63.5 2.2	56.76 .10	73.5 2.1
17.4	38 57.0 10.3	76.6 2.4	5.75 .10	8.3 0.3	8.86 .17	65.5 1.8	56.64 .14	75.4 1.8
27.3	38 45.6 12.6	78.8 2.0	5.64 .13	8.1 0.2	8.67 .21	67.2 1.4	56.48 .18	77.0 1.4
Sept. 6.3	38 32.0−14.4	80.5 −1.5	5.49 −.16	8.0 +0.1	8.45 −.23	68.4 +1.0	56.28 −.21	78.3 +1.1
16.3	38 16.9 15.7	81.7 0.9	5.32 .17	8.0 0.0	8.20 .25	69.2 0.6	56.07 .23	79.2 0.7
26.3	38 0.7 16.4	82.4 −0.4	5.14 .18	8.1 −0.1	7.94 .26	69.6 +0.1	55.83 .24	79.6 +0.2
Oct. 6.2	37 44.2 16.5	82.5 +0.2	4.96 .18	8.2 0.2	7.68 .26	69.5 −0.3	55.59 .24	79.6 −0.2
16.2	37 27.9 16.0	81.9 0.8	4.79 .16	8.5 0.3	7.42 .25	68.9 0.8	55.35 .23	79.2 0.6
26.2	37 12.5−14.7	80.8 +1.4	4.64 −.14	8.8 −0.4	7.18 −.23	67.9 −1.3	55.13 −.21	78.3 −1.1
Nov. 5.1	36 58.7 12.9	79.1 2.0	4.51 .11	9.3 0.5	6.97 .20	66.4 1.7	54.93 .18	77.0 1.5
15.1	36 47.0 10.5	76.9 2.4	4.42 .07	9.9 0.6	6.79 .16	64.5 2.1	54.77 .15	75.3 1.9
25.1	36 37.9 7.7	74.2 2.8	4.36 −.03	10.5 0.7	6.66 .11	62.2 2.5	54.64 .10	73.2 2.3
Dec. 5.1	36 31.9 4.5	71.3 3.1	4.35 +.01	11.3 0.8	6.57 .06	59.5 2.8	54.56 .06	70.8 2.6
15.0	36 29.0− 1.2	68.1 +3.3	4.38 +.06	12.1 −0.9	6.54 −.01	56.6 −3.0	54.53 −.01	68.1 −2.8
25.0	36 29.6+ 2.2	64.8 3.3	4.46 .10	13.1 0.9	6.56 +.05	53.5 3.2	54.54 +.04	65.2 2.9
35.0	36 33.4+ 5.5	61.5 +3.3	4.58 +.14	14.0 −1.0	6.63 +.11	50.3 −3.2	54.61 +.09	62.2 −3.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ Sagittarii.		50 Draconis.		ζ Aquilæ.		*d* Sagittarii.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 18 48	° ′ −26 25	h m 18 49	° ′ +75 17	h m 19 0	° ′ +13 41	h m 19 10	° ′ −19 8
	s	″	s	″	s	″	s	″
Jan. 0.0	13.32 +.12	64.0 +0.2	56.21 −.10	69.3 −3.5	11.19 +.07	52.6 −2.1	59.33 +.09	66.4 −0.2
10.0	13.46 .16	63.8 0.2	56.20 +.07	65.8 3.6	11.28 .11	50.5 2.1	59.44 .13	66.6 0.1
20.0	13.64 .20	63.6 0.2	56.36 .24	62.2 3.5	11.41 .15	48.4 2.0	59.59 .16	66.7 0.1
29.9	13.86 .23	63.3 0.2	56.67 .39	58.8 3.3	11.58 .18	46.4 1.9	59.77 .20	66.8 −0.1
Feb. 8.9	14.10 .26	63.1 0.2	57.14 .54	55.7 2.9	11.78 .21	44.6 1.6	59.98 .22	66.8 0.0
18.9	14.37 +.28	62.9 +0.2	57.75 +.66	53.0 −2.5	12.00 +.23	43.2 −1.3	60.22 +.25	66.8 +0.1
28.8	14.66 .30	62.6 0.3	58.45 .75	50.9 1.9	12.24 .25	42.0 1.0	60.48 .27	66.7 0.2
Mar. 10.8	14.96 .31	62.4 0.3	59.25 .83	49.2 1.3	12.50 .27	41.2 0.6	60.75 .28	66.4 0.3
20.8	15.28 .32	62.0 0.3	60.11 .87	48.2 −0.7	12.78 .28	40.8 −0.2	61.04 .29	66.1 0.4
30.8	15.60 .32	61.7 0.4	60.99 .88	47.8 0.0	13.06 .28	40.9 +0.3	61.34 .30	65.6 0.5
Apr. 9.7	15.92 +.32	61.3 +0.4	61.87 +.87	48.1 +0.6	13.35 +.29	41.3 +0.7	61.65 +.31	65.1 +0.6
19.7	16.24 .32	60.9 0.4	62.72 .83	49.1 1.2	13.63 .28	42.2 1.0	61.95 .31	64.4 0.7
29.7	16.55 .31	60.5 0.4	63.52 .76	50.6 1.8	13.91 .27	43.4 1.4	62.26 .30	63.7 0.7
May 9.7	16.86 .29	60.1 0.3	64.24 .67	52.7 2.3	14.18 .26	45.0 1.7	62.55 .29	63.0 0.7
19.6	17.14 .27	59.8 0.3	64.85 .55	55.2 2.7	14.43 .24	46.8 1.9	62.84 .27	62.2 0.7
29.6	17.41 +.25	59.6 +0.2	65.35 +.43	58.0 +3.0	14.67 +.22	48.7 +2.0	63.10 +.25	61.5 +0.7
June 8.6	17.64 .22	59.5 +0.1	65.71 .29	61.2 3.2	14.87 .19	50.8 2.1	63.34 .22	60.9 0.6
18.5	17.84 .18	59.5 0.0	65.93 +.15	64.5 3.3	15.04 .15	53.0 2.1	63.55 .19	60.4 0.5
28.5	18.00 .14	59.6 −0.1	66.01 .00	67.8 3.4	15.18 .11	55.1 2.1	63.72 .15	60.0 0.4
July 8.5	18.11 .09	59.8 0.2	65.93 −.15	71.2 3.3	15.27 .07	57.2 2.0	63.86 .11	59.7 0.2
18.5	18.18 +.05	60.1 −0.3	65.71 −.29	74.5 +3.2	15.33 +.03	59.1 +1.9	63.94 +.06	59.5 +0.1
28.4	18.21 .00	60.5 0.4	65.35 .43	77.6 3.0	15.34 −.01	60.9 1.7	63.99 +.02	59.4 0.0
Aug. 7.4	18.18 −.05	60.9 0.5	64.86 .55	80.5 2.7	15.30 .05	62.5 1.5	63.98 −.02	59.5 −0.1
17.4	18.11 .09	61.4 0.5	64.24 .67	83.0 2.4	15.23 .09	63.8 1.2	63.93 .07	59.6 0.2
27.4	18.00 .13	61.8 0.5	63.52 .76	85.2 2.0	15.12 .13	64.9 1.0	63.84 .11	59.9 0.2
Sept. 6.3	17.85 −.16	62.3 −0.4	62.72 −.84	86.9 +1.5	14.97 −.16	65.8 +0.7	63.71 −.14	60.1 −0.3
16.3	17.67 .18	62.7 0.4	61.84 .90	88.2 1.0	14.80 .18	66.4 0.4	63.56 .16	60.4 0.3
26.3	17.48 .19	63.0 0.3	60.92 .93	89.0 +0.6	14.62 .19	66.6 +0.1	63.38 .18	60.7 0.3
Oct. 6.2	17.29 .19	63.3 0.2	59.97 .95	89.3 0.0	14.43 .19	66.6 −0.2	63.20 .18	61.0 0.3
16.2	17.10 .18	63.4 −0.1	59.02 .93	89.1 −0.5	14.24 .18	66.3 0.5	63.02 .18	61.3 0.3
26.2	16.92 −.16	63.4 0.0	58.10 −.90	88.3 −1.0	14.06 −.17	65.7 −0.8	62.85 −.16	61.6 −0.2
Nov. 5.2	16.77 .13	63.4 +0.1	57.23 .84	87.0 1.6	13.91 .14	64.8 1.0	62.70 .13	61.8 0.2
15.1	16.66 .09	63.3 0.2	56.44 .74	85.2 2.1	13.78 .11	63.6 1.3	62.58 .10	62.0 0.2
25.1	16.58 −.05	63.1 0.2	55.74 .63	82.9 2.5	13.68 .07	62.2 1.6	62.49 .06	62.1 0.2
Dec. 5.1	16.56 .00	62.9 0.2	55.17 .50	80.1 2.9	13.63 −.03	60.5 1.8	62.45 −.02	62.3 0.2
15.1	16.58 +.05	62.6 +0.2	54.74 −.36	77.0 −3.2	13.62 +.01	58.6 −2.0	62.45 +.02	62.5 −0.2
25.0	16.65 .10	62.4 0.2	54.46 .20	73.6 3.5	13.65 .05	56.6 2.1	62.49 .07	62.7 0.2
35.0	16.77 +.14	62.2 +0.2	54.34 −.03	70.1 −3.6	13.72 +.09	54.5 −2.1	62.58 +.11	62.8 −0.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Draconis.		τ Draconis.		δ Aquilæ.		κ Aquilæ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 19 12	° ′ +67 27	h m 19 17	° ′ +73 8	h m 19 19	° ′ + 2 53	h m 19 30	° ′ − 7 16
	s	″	s	″	s	″	s	″
Jan. 0.0	28.57 −.08	55.5 −3.5	39.56 −.16	53.6 −3.5	46.23 +.06	30.3 −1.5	46.83 +.06	35.8 −0.8
10.0	28.55 +.03	51.9 3.6	39.47 −.01	50.1 3.5	46.32 .10	28.8 1.5	46.91 .10	36.6 0.8
20.0	28.63 .14	48.3 3.5	39.53 +.13	46.5 3.5	46.44 .14	27.4 1.4	47.03 .13	37.5 0.8
29.9	28.82 .24	44.9 3.3	39.73 .27	43.1 3.4	46.59 .17	26.0 1.3	47.18 .16	38.2 0.7
Feb. 8.9	29.11 .33	41.7 3.0	40.07 .40	39.8 3.1	46.77 .20	24.8 1.1	47.36 .19	38.8 0.6
18.9	29.49 +.42	38.8 −2.6	40.52 +.51	36.9 −2.7	46.98 +.22	23.8 −0.9	47.56 +.22	39.3 −0.4
28.9	29.94 .49	36.4 2.1	41.09 .61	34.4 2.2	47.22 .24	23.1 0.6	47.79 .24	39.6 −0.2
Mar. 10.8	30.46 .54	34.5 1.5	41.75 .69	32.5 1.6	47.46 .26	22.6 −0.3	48.04 .26	39.7 +0.1
20.8	31.03 .58	33.3 0.9	42.47 .74	31.1 1.0	47.73 .27	22.5 0.0	48.31 .27	39.5 0.3
30.8	31.62 .60	32.7 −0.3	43.23 .77	30.4 −0.4	48.01 .28	22.6 +0.3	48.58 .28	39.2 0.5
Apr. 9.7	32.23 +.60	32.8 +0.4	44.01 +.78	30.4 +0.3	48.29 +.28	23.1 +0.7	48.87 +.29	38.6 +0.7
19.7	32.83 .59	33.5 1.0	44.78 .76	31.0 0.9	48.58 .29	24.0 1.0	49.16 .29	37.7 0.9
29.7	33.41 .55	34.9 1.6	45.52 .71	32.2 1.5	48.86 .28	25.0 1.2	49.46 .29	36.8 1.1
May 9.7	33.94 .50	36.7 2.1	46.20 .64	34.0 2.0	49.14 .27	26.4 1.4	49.74 .28	35.6 1.2
19.6	34.41 .44	39.1 2.6	46.81 .56	36.3 2.5	49.40 .26	27.9 1.6	50.02 .27	34.4 1.2
29.6	34.82 +.37	41.9 +2.9	47.33 +.46	39.0 +2.9	49.65 +.24	29.5 +1.6	50.28 +.25	33.2 +1.3
June 8.6	35.15 .28	45.0 3.2	47.74 .35	42.0 3.1	49.87 .21	31.2 1.7	50.52 .22	31.9 1.3
18.6	35.38 .19	48.3 3.4	48.03 .23	45.3 3.3	50.07 .18	32.8 1.7	50.73 .19	30.6 1.2
28.5	35.52 +.09	51.7 3.4	48.19 +.10	48.7 3.4	50.23 .14	34.5 1.6	50.91 .16	29.5 1.1
July 8.5	35.57 −.01	55.1 3.4	48.23 −.03	52.1 3.4	50.35 .10	36.1 1.5	51.05 .12	28.4 1.0
18.5	35.51 −.10	58.6 +3.3	48.14 −.16	55.5 +3.3	50.43 +.06	37.5 +1.4	51.14 +.08	27.5 +0.8
28.4	35.36 .20	61.8 3.1	47.92 .28	58.8 3.2	50.47 +.02	38.8 1.2	51.20 +.03	26.7 0.7
Aug. 7.4	35.11 .29	64.8 2.9	47.57 .40	61.9 3.0	50.46 −.03	40.0 1.0	51.21 −.01	26.1 0.5
17.4	34.78 .37	67.6 2.6	47.11 .51	64.7 2.7	50.42 .07	40.9 0.9	51.17 .05	25.7 0.4
27.4	34.36 .45	70.1 2.2	46.56 .60	67.3 2.3	50.33 .10	41.7 0.7	51.10 .09	25.3 0.2
Sept. 6.3	33.88 −.51	72.1 +1.8	45.91 −.68	69.4 +1.9	50.21 −.13	42.2 +0.5	50.99 −.13	25.2 +0.1
16.3	33.35 .55	73.7 1.4	45.19 .75	71.1 1.5	50.06 .16	42.6 +0.2	50.85 .15	25.2 0.0
26.3	32.77 .59	74.8 0.9	44.42 .79	72.3 1.0	49.89 .17	42.7 0.0	50.69 .17	25.2 −0.1
Oct. 6.3	32.18 .60	75.4 +0.3	43.61 .81	73.0 +0.4	49.72 .18	42.7 −0.2	50.51 .17	25.4 0.2
16.2	31.57 .60	75.5 −0.2	42.79 .81	73.2 −0.1	49.54 .17	42.4 0.3	50.34 .17	25.7 0.3
26.2	30.98 −.58	75.0 −0.8	41.98 −.79	72.9 −0.6	49.37 −.16	42.0 −0.5	50.17 −.16	26.1 −0.4
Nov. 5.2	30.42 .54	74.0 1.3	41.21 .75	72.0 1.2	49.22 .14	41.3 0.7	50.02 .14	26.6 0.5
15.1	29.90 .49	72.4 1.8	40.48 .69	70.5 1.7	49.09 .11	40.5 0.9	49.89 .11	27.1 0.6
25.1	29.44 .42	70.3 2.3	39.83 .60	68.5 2.2	49.00 .08	39.5 1.1	49.80 .08	27.8 0.7
Dec. 5.1	29.06 .34	67.7 2.8	39.28 .50	66.1 2.7	48.94 −.04	38.3 1.2	49.74 −.04	28.5 0.8
15.1	28.76 −.24	64.8 −3.1	38.84 −.38	63.2 −3.0	48.93 .00	37.0 −1.4	49.72 .00	29.3 −0.8
25.0	28.57 .14	61.5 3.4	38.52 .25	60.0 3.3	48.95 +.04	35.6 1.4	49.74 +.04	30.1 0.8
35.0	28.48 −.04	58.0 −3.6	38.34 −.10	56.6 −3.6	49.01 +.08	34.1 −1.5	49.80 +.08	31.0 −0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Aquilæ.		α Aquilæ. (*Altair.*)		ε Draconis.		β Aquilæ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 19 40	° ′ +10 20	h m 19 45	° ′ + 8 34	h m 19 48	° ′ +69 58	h m 19 49	° ′ + 6 7
	s	″	s	″	s	″	s	″
Jan. 0.0	51.50 +.04	24.5 −1.8	14.46 +.04	19.4 −1.7	29.96 −.19	60.1 −3.3	44.01 +.03	35.6 −1.5
10.0	51.56 .08	22.7 1.8	14.51 .07	17.7 1.7	29.82 −.08	56.7 3.4	44.06 .07	34.0 1.6
20.0	51.66 .11	20.9 1.8	14.60 .11	16.0 1.6	29.80 +.04	53.2 3.5	44.15 .11	32.5 1.5
30.0	51.79 .14	19.2 1.6	14.73 .14	14.4 1.5	29.90 .16	49.7 3.4	44.27 .14	31.0 1.4
Feb. 8.9	51.94 .17	17.6 1.4	14.89 .17	12.9 1.3	30.12 .27	46.3 3.2	44.43 .17	29.6 1.2
18.9	52.13 +.20	16.3 −1.2	15.08 +.20	11.7 −1.1	30.44 +.38	43.2 −2.9	44.61 +.19	28.5 −1.0
28.9	52.35 .22	15.2 0.9	15.29 .22	10.7 0.8	30.87 .47	40.5 2.5	44.82 .22	27.6 0.7
Mar. 10.9	52.58 .24	14.5 0.5	15.52 .24	10.1 0.5	31.38 .55	38.3 2.0	45.05 .24	27.1 0.4
20.8	52.84 .26	14.1 −0.2	15.77 .26	9.8 −0.1	31.96 .60	36.6 1.4	45.30 .27	26.8 −0.1
30.8	53.11 .27	14.1 +0.2	16.04 .27	9.9 +0.3	32.59 .64	35.5 0.7	45.56 .28	26.9 +0.3
Apr. 9.8	53.39 +.28	14.6 +0.6	16.32 +.28	10.3 +0.6	33.25 +.66	35.1 −0.1	45.84 +.28	27.4 +0.6
19.7	53.67 .29	15.4 1.0	16.61 .29	11.1 1.0	33.92 .66	35.3 +0.6	46.13 .29	28.2 1.0
29.7	53.96 .29	16.5 1.3	16.90 .29	12.3 1.3	34.58 .64	36.2 1.2	46.41 .29	29.3 1.2
May 9.7	54.25 .28	18.0 1.6	17.19 .28	13.7 1.5	35.21 .60	37.7 1.7	46.70 .28	30.7 1.5
19.7	54.52 .27	19.7 1.8	17.46 .27	15.4 1.7	35.78 .55	39.7 2.2	46.98 .27	32.3 1.7
29.6	54.78 +.25	21.5 +1.9	17.72 +.25	17.2 +1.9	36.30 +.47	42.2 +2.7	47.24 +.25	34.0 +1.8
June 8.6	55.01 .22	23.5 2.0	17.96 .23	19.2 2.0	36.73 .39	45.0 3.0	47.48 .23	35.9 1.9
18.6	55.22 .19	25.6 2.1	18.17 .20	21.2 2.0	37.07 .29	48.2 3.3	47.70 .20	37.7 1.9
28.6	55.40 .15	27.7 2.0	18.35 .16	23.1 2.0	37.31 .19	51.5 3.4	47.88 .17	39.6 1.8
July 8.5	55.53 .11	29.7 2.0	18.50 .12	25.1 1.9	37.44 +.08	55.0 3.5	48.03 .13	41.4 1.7
18.5	55.63 +.07	31.6 +1.8	18.60 +.08	26.9 +1.8	37.47 −.03	58.5 +3.5	48.14 +.08	43.1 +1.6
28.5	55.68 +.03	33.3 1.7	18.65 +.03	28.6 1.6	37.38 .14	62.0 3.4	48.20 +.04	44.7 1.5
Aug. 7.4	55.68 −.02	34.9 1.5	18.67 −.01	30.1 1.4	37.18 .25	65.3 3.2	48.21 .00	46.0 1.3
17.4	55.65 .06	36.3 1.3	18.64 .05	31.4 1.2	36.88 .35	68.4 3.0	48.19 −.05	47.2 1.1
27.4	55.57 .10	37.4 1.0	18.56 .09	32.5 1.0	36.49 .44	71.2 2.7	48.12 .09	48.2 0.8
Sept. 6.4	55.45 −.13	38.3 +0.8	18.46 −.12	33.4 +0.7	36.01 −.51	73.7 +2.3	48.02 −.12	48.9 +0.6
16.3	55.31 .15	39.0 0.5	18.32 .15	34.0 0.5	35.46 .58	75.8 1.9	47.88 .15	49.4 0.4
26.3	55.15 .17	39.4 +0.2	18.16 .17	34.3 +0.2	34.86 .62	77.4 1.4	47.73 .16	49.7 +0.2
Oct. 6.3	54.97 .18	39.5 0.0	17.98 .18	34.5 0.0	34.21 .66	78.6 0.9	47.55 .17	49.8 −0.1
16.3	54.79 .18	39.3 −0.3	17.80 .18	34.3 −0.3	33.54 .67	79.2 +0.4	47.38 .17	49.6 0.3
26.2	54.61 −.17	38.9 −0.5	17.63 −.17	34.0 −0.5	32.87 −.66	79.3 −0.2	47.21 −.17	49.2 −0.5
Nov. 5.2	54.44 .15	38.3 0.8	17.47 .15	33.3 0.7	32.21 .64	78.9 0.7	47.05 .15	48.6 0.7
15.2	54.30 .13	37.3 1.0	17.33 .13	32.5 1.0	31.59 .60	77.9 1.3	46.91 .12	47.8 0.9
25.2	54.19 .10	36.2 1.3	17.22 .10	31.4 1.2	31.02 .54	76.3 1.8	46.80 .10	46.8 1.1
Dec. 5.1	54.11 .06	34.8 1.5	17.14 .06	30.1 1.4	30.51 .46	74.2 2.3	46.72 .06	45.5 1.3
15.1	54.07 −.02	33.3 −1.6	17.10 −.02	28.6 −1.5	30.10 −.37	71.6 −2.8	46.67 −.02	44.2 −1.4
25.1	54.07 +.02	31.5 1.7	17.10 +.02	27.1 1.6	29.78 .27	68.6 3.1	46.67 +.01	42.7 1.5
35.0	54.11 +.05	29.7 −1.8	17.13 +.05	25.4 −1.7	29.56 −.15	65.4 −3.4	46.70 +.05	41.1 −1.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	τ Aquilæ.		α² Capricorni.		κ Cephei.		α Pavonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	$19^h\ 58^m$	$+6^\circ\ 57'$	$20^h\ 11^m$	$-12^\circ\ 53'$	$20^h\ 12^m$	$+77^\circ\ 22'$	$20^h\ 16^m$	$-57^\circ\ 5'$
	s	″	s	″	s	″	s	″
Jan. 0.1	35.50 +.02	39.8 −1.5	45.19 +.03	37.6 −0.4	36.75 −.47	27.8 −3.0	39.08 .00	48.1 +2.1
10.0	35.55 .06	38.2 1.6	45.24 .06	38.0 0.4	36.37 .29	24.6 3.3	39.12 +.07	46.0 2.2
20.0	35.63 .10	36.6 1.5	45.32 .10	38.4 0.3	36.17 −.10	21.2 3.4	39.22 .14	43.7 2.3
30.0	35.74 .13	35.2 1.4	45.43 .13	38.6 0.2	36.17 +.09	17.7 3.4	39.40 .20	41.3 2.4
Feb. 9.0	35.89 .16	33.8 1.3	45.58 .16	38.8 −0.1	36.35 .28	14.3 3.3	39.63 .26	39.0 2.3
18.9	36.06 +.19	32.6 −1.0	45.75 +.19	38.8 0.0	36.72 +.45	11.1 −3.1	39.92 +.32	36.7 +2.2
28.9	36.26 .21	31.7 0.7	45.96 .21	38.7 +0.2	37.26 .61	8.2 2.7	40.26 .36	34.5 2.1
Mar. 10.9	36.48 .23	31.2 0.4	46.18 .24	38.4 0.3	37.97 .75	5.7 2.2	40.65 .40	32.4 2.0
20.8	36.73 .25	30.9 −0.1	46.43 .26	37.9 0.5	38.78 .86	3.7 1.7	41.07 .44	30.5 1.8
30.8	36.99 .27	31.0 +0.3	46.70 .28	37.3 0.7	39.68 .94	2.3 1.1	41.53 .47	28.8 1.6
Apr. 9.8	37.27 +.28	31.5 +0.6	46.98 +.29	36.4 +0.9	40.65 +.99	1.5 −0.5	42.01 +.49	27.4 +1.3
19.8	37.55 .29	32.3 1.0	47.27 .30	35.4 1.1	41.66 1.01	1.3 +0.2	42.51 .50	26.3 1.0
29.7	37.84 .29	33.4 1.3	47.58 .30	34.3 1.2	42.66 .99	1.8 0.8	43.02 .51	25.4 0.7
May 9.7	38.13 .28	34.8 1.5	47.88 .30	33.1 1.2	43.64 .94	2.9 1.4	43.53 .51	24.9 +0.4
19.7	38.41 .27	36.4 1.7	48.18 .29	31.9 1.2	44.54 .86	4.6 1.9	44.03 .49	24.7 0.0
29.7	38.68 +.26	38.2 +1.8	48.47 +.28	30.7 +1.2	45.35 +.75	6.7 +2.4	44.51 +.47	24.9 −0.4
June 8.6	38.93 .24	40.1 1.9	48.74 .26	29.4 1.2	46.04 .63	9.3 2.8	44.96 .43	25.4 0.7
18.6	39.15 .21	42.0 1.9	48.98 .23	28.3 1.1	46.60 .48	12.2 3.1	45.37 .39	26.3 1.0
28.6	39.34 .17	44.0 1.9	49.20 .20	27.3 0.9	47.01 .33	15.5 3.3	45.73 .33	27.5 1.3
July 8.5	39.49 .13	45.8 1.8	49.38 .16	26.4 0.8	47.26 +.16	18.9 3.4	46.03 .26	28.9 1.6
18.5	39.61 +.09	47.6 +1.7	49.52 +.12	25.7 +0.6	47.34 −.01	22.3 +3.5	46.26 +.19	30.6 −1.8
28.5	39.67 +.05	49.3 1.5	49.61 .07	25.2 0.5	47.25 .17	25.8 3.5	46.42 .12	32.6 2.0
Aug. 7.5	39.70 .00	50.7 1.4	49.66 +.03	24.8 0.3	46.99 .34	29.3 3.4	46.49 +.04	34.6 2.1
17.4	39.68 −.04	52.0 1.2	49.67 −.02	24.6 +0.1	46.57 .49	32.5 3.2	46.49 −.03	36.7 2.1
27.4	39.62 .08	53.0 0.9	49.63 .06	24.5 0.0	46.01 .63	35.6 2.9	46.41 .11	38.8 2.0
Sept. 6.4	39.52 −.11	53.8 +0.7	49.55 −.10	24.6 −0.1	45.31 −.76	38.4 +2.6	46.26 −.18	40.7 −1.9
16.4	39.39 .14	54.4 0.5	49.43 .13	24.8 0.2	44.49 .87	40.8 2.2	46.04 .24	42.5 1.7
26.3	39.24 .16	54.8 +0.2	49.29 .15	25.1 0.3	43.57 .96	42.9 1.8	45.78 .29	44.1 1.4
Oct. 6.3	39.07 .17	54.9 0.0	49.13 .16	25.4 0.4	42.58 1.02	44.5 1.3	45.47 .31	45.3 1.0
16.3	38.90 .17	54.8 −0.2	48.96 .17	25.8 0.4	41.53 1.06	45.6 0.8	45.15 .33	46.2 0.7
26.2	38.72 −.17	54.4 −0.5	48.79 −.16	26.3 −0.4	40.45 −1.07	46.1 +0.3	44.82 −.32	46.6 −0.2
Nov. 5.2	38.56 .15	53.9 0.7	48.63 .15	26.7 0.4	39.38 1.06	46.2 −0.3	44.50 .31	46.7 +0.2
15.2	38.42 .13	53.0 0.9	48.49 .13	27.2 0.5	38.33 1.02	45.6 0.8	44.21 .27	46.3 0.6
25.2	38.30 .10	52.1 1.1	48.38 .10	27.8 0.5	37.34 .94	44.5 1.4	43.96 .22	45.4 1.0
Dec. 5.1	38.22 .07	50.9 1.3	48.29 .07	28.1 0.5	36.44 .85	42.8 1.9	43.76 .17	44.3 1.4
15.1	38.17 −.03	49.5 −1.4	48.24 −.03	28.6 −0.5	35.65 −.72	40.6 −2.4	43.63 −.10	42.7 +1.7
25.1	38.15 +.01	48.0 1.5	48.23 +.01	29.1 0.5	35.00 .57	37.9 2.8	43.56 −.03	40.9 1.9
35.1	38.18 +.04	46.5 −1.6	48.26 +.04	29.5 −0.4	34.51 −.41	34.9 −3.2	43.56 +.04	38.8 +2.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Cygni.		π Capricorni.		ε Delphini.		Groombridge 3241.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$20^{h}\ 18^{m}$	$+39^{\circ}\ 53'$	$20^{h}\ 20^{m}$	$-18^{\circ}\ 34'$	$20^{h}\ 27^{m}$	$+10^{\circ}\ 55'$	$20^{h}\ 30^{m}$	$+72^{\circ}\ 8'$
	s	″	s	″	s	″	s	″
Jan. 0.1	8.79 −.05	52.7 −2.8	49.23 +.02	52.4 −0.1	47.26 −.01	16.6 −1.6	26.54 −.35	69.3 −2.9
10.0	8.77 .00	49.9 2.9	49.27 .06	52.5 0.0	47.28 +.03	15.0 1.7	26.25 .23	66.2 3.2
20.0	8.79 +.05	46.9 3.0	49.34 .09	52.5 +0.1	47.32 .06	13.3 1.7	26.09 −.10	62.8 3.4
30.0	8.86 .09	44.0 2.9	49.45 .13	52.4 0.2	47.40 .10	11.6 1.6	26.05 +.03	59.4 3.4
Feb. 9.0	8.98 .14	41.1 2.7	49.60 .16	52.1 0.3	47.52 .13	10.1 1.4	26.15 .17	56.0 3.3
18.9	9.14 +.18	38.5 −2.5	49.77 +.19	51.8 +0.4	47.67 +.16	8.8 −1.2	26.39 +.29	52.7 −3.1
28.9	9.34 .22	36.2 2.1	49.97 .21	51.3 0.5	47.84 .19	7.7 0.9	26.74 .41	49.7 2.8
Mar. 10.9	9.58 .26	34.3 1.6	50.19 .24	50.8 0.7	48.04 .21	7.0 0.6	27.21 .51	47.1 2.4
20.9	9.85 .29	33.0 1.1	50.44 .26	50.0 0.8	48.27 .24	6.5 −0.2	27.77 .60	44.9 1.9
30.8	10.15 .31	32.1 −0.5	50.71 .28	49.2 0.9	48.52 .26	6.5 +0.2	28.41 .67	43.3 1.3
Apr. 9.8	10.47 +.33	31.9 0.0	51.00 +.29	48.2 +1.0	48.79 +.28	6.8 +0.5	29.10 +.71	42.4 −0.6
19.8	10.81 .34	32.2 +0.6	51.30 .31	47.1 1.1	49.07 .29	7.6 0.9	29.83 .73	42.1 0.0
29 7	11.15 .34	33.1 1.1	51.61 .31	46.0 1.2	49.36 .29	8.6 1.2	30.57 .73	42.4 +0.6
May 9.7	11.50 .34	34.5 1.6	51.93 .31	44.8 1.2	49.65 .29	10.0 1.5	31.30 .71	43.4 1.2
19.7	11.83 .32	36.4 2.1	52.24 .30	43.6 1.1	49.94 .29	11.7 1.8	31.99 .67	44.9 1.8
29.7	12.14 +.30	38.6 +2.4	52.54 +.29	42.5 +1.1	50.22 +.27	13.6 +2.0	32.63 +.60	46.9 +2.3
June 8.6	12.42 .27	41.3 2.7	52.82 .27	41.4 1.0	50.49 .25	15.6 2.1	33.19 .52	49.4 2.7
18.6	12.67 .23	44.1 3.0	53.08 .25	40.5 0.7	50.73 .23	17.7 2.1	33.67 .42	52.3 3.0
28.6	12.89 .19	47.2 3.1	53.31 .21	39.8 0.7	50.94 .20	19.9 2.1	34.04 .32	55.5 3.3
July 8.6	13.05 .14	50.3 3.1	53.51 .17	39.2 0.5	51.12 .16	22.0 2.1	34.30 .20	58.9 3.4
18.5	13.16 +.09	53.4 +3.1	53.66 +.13	38.8 +0.3	51.26 +.11	24.0 +2.0	34.44 +.08	62.4 +3.5
28.5	13.23 +.04	56.5 3.0	53.77 .08	38.5 +0.1	51.35 .07	26.0 1.8	34.46 −.04	66.0 3.5
Aug. 7.5	13.23 −.02	59.5 2.9	53.83 +.04	38.5 0.0	51.40 +.03	27.7 1.6	34.36 .16	69.5 3.5
17.4	13.19 .07	62.2 2.6	53.84 −.01	38.6 −0.2	51.41 −.02	29.2 1.4	34.14 .27	72.9 3.3
27.4	13.09 .12	64.7 2.3	53.81 .05	38.8 0.3	51.37 .06	30.6 1.2	33.81 .38	76.1 3.1
Sept. 6.4	12.95 −.16	66.9 +2.0	53.74 −.09	39.2 −0.4	51.29 −.09	31.7 +1.0	33.37 −.48	79.0 +2.8
16.4	12.77 .20	68.8 1.7	53.63 .13	39.6 0.5	51.18 .13	32.5 0.7	32.85 .56	81.6 2.4
26.3	12.55 .22	70.2 1.3	53.48 .15	40.1 0.5	51.04 .15	33.1 0.5	32.25 .63	83.9 2.0
Oct. 6.3	12.32 .24	71.3 0.8	53.32 .17	40.6 0.5	50.88 .16	33.4 +0.2	31.58 .69	85.7 1.5
16.3	12.07 .25	71.8 +0.4	53.15 .17	41.2 0.5	50.71 .17	33.5 −0 1	30.87 .72	87.0 1.0
26.2	11.82 −.25	72.0 −0.1	52.98 −.17	41.7 −0.5	50.53 −.17	33.3 −0.3	30.14 −.74	87.7 +0.5
Nov. 5.2	11.57 .24	71.6 0.6	52.82 .16	42.1 0.4	50.37 .16	32.8 0.6	29.40 .73	87.9 −0.1
15.2	11.34 .22	70.8 1.1	52.67 .13	42.5 0.4	50.22 .14	32.1 0.8	28.68 .71	87.6 0.6
25.2	11.14 .19	69.5 1.5	52.55 .11	42.8 0.3	50.08 .12	31.1 1.1	27.99 .66	86.7 1.2
Dec. 5.1	10.96 .16	67.7 1.9	52.46 .07	43.1 0.3	49.98 .09	29.9 1.3	27.35 .60	85.1 1.8
15.1	10.83 −.12	65.6 −2.3	52.40 −.04	43.3 −0.2	49.91 −.06	28.5 −1.5	26.79 −.52	83.1 −2.3
25.1	10.73 .07	63.1 2.6	52.38 .00	43.5 0.1	49.86 −.02	27.0 1.6	26.32 .42	80.6 2.7
35.1	10.68 −.03	60.4 −2.9	52.40 +.04	43.6 −0.1	49.86 +.01	25.4 −1.7	25.96 −.30	77.7 −3.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Cygni.		μ Aquarii.		12 Year Cat. 1879.		ν Cygni.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 20 37	° ′ +44 52	h m 20 46	° ′ − 9 24	h m 20 52	° ′ +80 7	h m 20 52	° ′ +40 43
	s	″	s	″	s	″	s	″
Jan. 0.1	33.18 −.09	47.2 −2.7	31.78 −.01	23.4 −0.6	37.37 −.81	55.8 −2.7	56.12 −.09	67.0 −2.5
10.1	33.11 −.04	44.4 2.9	31.79 +.03	24.0 0.5	36.66 .60	53.0 3.0	56.05 −.04	64.4 2.7
20.0	33.10 +.01	41.4 3.0	31.83 .06	24.5 0.4	36.18 .37	49.8 3.2	56.03 .00	61.6 2.9
30.0	33.14 .06	38.3 3.0	31.91 .09	24.9 0.3	35.92 −.13	46.5 3.4	56.06 +.05	58.7 2.9
Feb. 9.0	33.23 .11	35.3 2.9	32.02 .12	25.1 −0.2	35.91 +.11	43.1 3.4	56.13 .09	55.8 2.8
19.0	33.37 +.16	32.5 −2.7	32.16 +.15	25.3 0.0	36.14 +.35	39.7 −3.2	56.24 +.14	53.2 −2.5
28.9	33.56 .21	30.0 2.3	32.32 .18	25.2 +0.2	36.61 .57	36.6 3.0	56.41 .18	50.7 2.2
Mar. 10.9	33.79 .25	27.9 1.9	32.52 .21	25.0 0.4	37.30 .78	33.8 2.6	56.61 .22	48.7 1.8
20.9	34.06 .29	26.2 1.4	32.74 .25	24.5 0.6	38.17 .95	31.4 2.1	56.86 .26	47.1 1.4
30.8	34.37 .32	25.1 0.8	32.98 .25	23.8 0.8	39.20 1.09	29.5 1.6	57.14 .29	46.0 0.8
Apr. 9.8	34.70 +.34	24.6 −0.2	33.25 +.27	23.0 +1.0	40.35+1.19	28.1 −1.0	57.44 +.32	45.4 −0.3
19.8	35.05 .36	24.7 +0.3	33.53 .29	21.9 1.2	41.58 1.25	27.4 −0.4	57.77 .34	45.4 +0.3
29.8	35.42 .36	25.3 0.9	33.82 .30	20.6 1.3	42.85 1.26	27.3 +0.2	58.12 .35	46.0 0.8
May 9.7	35.78 .36	26.5 1.5	34.12 .30	19.3 1.4	44.11 1.23	27.9 0.8	58.47 .35	47.1 1.4
19.7	36.14 .35	28.2 1.9	34.42 .30	17.8 1.5	45.31 1.16	29.0 1.4	58.82 .34	48.7 1.8
29.7	36.48 +.33	30.4 +2.4	34.72 +.29	16.3 +1.5	46.44+1.06	30.7 +1.9	59.15 +.33	50.8 +2.2
June 8.6	36.80 .30	32.9 2.7	35.00 27	14.8 1.4	47.44 .93	32.9 2.4	59.47 .30	53.2 2.6
18.6	37.08 .26	35.8 3.0	35.27 .25	13.4 1.4	48.30 .77	35.5 2.8	59.75 .27	56.0 2.8
28.6	37.31 .21	38.9 3.1	35.51 .22	12.1 1.3	48.98 .59	38.4 3.1	60.00 .23	58.9 3.0
July 8.6	37.50 .16	42.1 3.2	35.72 .19	10.9 1.1	49.47 .39	41.7 3.3	60.20 .18	62.0 3.1
18.5	37.64 +.11	45.4 +3.3	35.88 +.15	9.9 +0.9	49.77+ .19	45.1 +3.5	60.36 +.13	65.2 +3.2
28.5	37.72 +.05	48.6 3.2	36.01 .10	9.1 0.7	49.85− .02	48.6 3.5	60.46 .08	68.4 3.1
Aug. 7.5	37.75 .00	51.8 3.1	36.09 .06	8.4 0.5	49.73 .23	52.1 3.5	60.51 +.02	71.4 3.0
17.5	37.71 −.06	54.8 2.9	36.12 +.01	8.0 0.4	49.40 .43	55.7 3.4	60.51 −.03	74.4 2.8
27.4	37.63 .11	57.5 2.6	36.11 −.03	7.7 +0.2	48.88 .61	59.0 3.2	60.45 .08	77.1 2.6
Sept. 6.4	37.49 −.16	60.0 +2.3	36.06 −.07	7.6 0.0	48.16− .80	62.2 +3.0	60.35 −.13	79.5 +2.3
16.4	37.31 .20	62.2 2.0	35.97 .10	7.6 −0.1	47.28 .95	65.1 2.8	60.20 .17	81.7 2.0
26.3	37.09 .23	64.0 1.6	35.86 .13	7.8 0.2	46.26 1.09	67.7 2.4	60.01 .20	83.5 1.6
Oct. 6.3	36.84 .25	65.3 1.1	35.71 .15	8.1 0.3	45.10 1.20	69.9 2.0	59.80 .22	84.9 1.2
16.3	36.58 .27	66.2 0.7	35.56 .16	8.5 0.4	43.85 1.29	71.6 1.5	59.57 .24	85.8 0.7
26.3	36.31 −.27	66.6 +0.2	35.40 −.16	9.0 −0.5	42.53−1.34	72.8 +1.0	59.32 −.24	86.4 +0.3
Nov. 5.2	36.04 .26	66.6 −0.3	35.24 .15	9.5 0.5	41.18 1.36	73.5 +0.4	59.08 .24	86.4 −0.2
15.2	35.78 .25	66.0 0.8	35.09 .13	10.1 0.6	39.82 1.34	73.6 −0.2	58.84 .23	85.9 0.7
25.2	35.54 .23	64.9 1.3	34.97 .11	10.6 0.6	38.49 1.29	73.2 0.8	58.62 .21	85.0 1.2
Dec. 5.2	35.32 .20	63.3 1.8	34.87 .09	11.2 0.6	37.23 1.20	72.1 1.3	58.43 .18	83.6 1.6
15.1	35.15 −.16	61.3 −2.2	34.79 −.06	11.9 −0.6	36.08−1.08	70.5 −1.9	58.26 −.15	81.8 −2.0
25.1	35.01 .11	58.9 2 6	34.75 −.02	12.5 0.6	35.07 .92	68.4 2.4	58.13 .11	79.6 2.3
35.1	34.92 −.07	56.2 −2.8	34.74 +.01	13.1 −0.6	34.23− .73	65.8 −2.8	58.04 −.07	77.1 −2.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	61¹ Cygni.		ζ Cygni.		α Cephei.		1 Pegasi.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$21^h\ 1^m$	$+38°\ 11'$	$21^h\ 8^m$	$+29°\ 45'$	$21^h\ 15^m$	$+62°\ 6'$	$21^h\ 16^m$	$+19°\ 19'$
	s	″	s	″	s	″	s	″
Jan. 0.1	48.46 −.08	48.6 −2.3	6.18 −.07	57.8 −2.1	51.29 −.26	39.0 −2.5	50.21 −.06	23.1 −1.8
10.1	48.40 −.04	46.1 2.5	6.13 −.03	55.5 2.3	51.07 .19	36.2 2.9	50.17 −.02	21.3 1.9
20.0	48.39 +.01	43.5 2.6	6.11 .00	53.1 2.4	50.92 .11	33.2 3.1	50.17 +.01	19.4 1.9
30.0	48.41 .05	40.8 2.7	6.14 +.04	50.7 2.4	50.85 −.03	30.0 3.3	50.19 .04	17.4 1.9
Feb. 9.0	48.48 .09	38.2 2.6	6.20 .08	48.3 2.3	50.85 +.05	26.6 3.3	50.25 .08	15.6 1.7
19.0	48.60 +.14	35.7 −2.4	6.30 +.12	46.0 −2.1	50.94 +.13	23.4 −3.1	50.34 +.11	13.8 −1.6
28.9	48.76 .18	33.4 2.1	6.44 .16	44.0 1.8	51.11 .21	20.3 2.9	50.47 .14	12.3 1.3
Mar. 10.9	48.96 .22	31.5 1.7	6.61 .19	42.4 1.5	51.36 .28	17.6 2.6	50.63 .18	11.2 1.0
20.9	49.20 .26	30.0 1.2	6.82 .23	41.1 1.0	51.67 .35	15.2 2.1	50.83 .21	10.3 0.6
30.9	49.47 .29	29.1 0.7	7.06 .26	40.3 0.6	52.06 .41	13.4 1.6	51.05 .24	9.9 −0.2
Apr. 9.8	49.78 +.32	28.6 −0.2	7.33 +.28	40.0 −0.1	52.49 +.46	12.1 −1.0	51.30 +.26	9.9 +0.2
19.8	50.11 .34	28.7 +0.4	7.63 .30	40.1 +0.4	52.97 .49	11.4 −0.4	51.57 .28	10.3 0.6
29.8	50.45 .35	29.3 0.9	7.94 .31	40.8 0.9	53.47 .51	11.4 +0.2	51.86 .30	11.1 1.0
May 9.7	50.80 .35	30.5 1.4	8.25 .32	41.9 1.4	53.99 .51	11.9 0.9	52.16 .30	12.3 1.4
19.7	51.15 .35	32.1 1.9	8.58 .32	43.5 1.8	54.50 .50	13.1 1.4	52.47 .30	13.9 1.7
29.7	51.49 +.33	34.2 +2.3	8.89 +.31	45.4 +2.1	54.99 +.48	14.8 +1.9	52.77 +.30	15.8 +2.0
June 8.7	51.81 .31	36.7 2.6	9.19 .29	47.7 2.4	55.46 .44	17.0 2.4	53.06 .28	17.9 2.2
18.6	52.11 .28	39.4 2.9	9.46 .26	50.2 2.6	55.87 .39	19.6 2.8	53.34 .26	20.2 2.4
28.6	52.37 .24	42.4 3.0	9.71 .23	52.9 2.8	56.23 .33	22.6 3.1	53.59 .23	22.7 2.5
July 8.6	52.59 .20	45.5 3.1	9.93 .19	55.7 2.8	56.53 .26	25.8 3.3	53.80 .20	25.2 2.5
18.6	52.77 +.15	48.7 +3.2	10.10 +.15	58.6 +2.8	56.75 +.18	29.3 +3.5	53.98 +.16	27.6 +2.4
28.5	52.89 .10	51.9 3.1	10.22 .10	61.4 2.8	56.89 .10	32.8 3.6	54.12 .11	30.0 2.3
Aug. 7.5	52.97 +.05	55.0 3.0	10.30 +.05	64.1 2.6	56.96 +.02	36.4 3.5	54.21 .07	32.3 2.2
17.5	52.99 −.01	58.0 2.9	10.33 .00	66.7 2.5	56.94 −.06	39.9 3.4	54.26 +.02	34.4 2.0
27.4	52.96 .05	60.7 2.6	10.31 −.04	69.0 2.2	56.84 .13	43.3 3.3	54.26 −.02	36.3 1.8
Sept. 6.4	52.88 −.10	63.2 +2.4	10.24 −.08	71.2 +2.0	56.67 −.20	46.5 +3.0	54.22 −.06	38.0 +1.5
16.4	52.76 .14	65.5 2.0	10.14 .12	73.0 1.7	56.43 .27	49.4 2.7	54.14 .10	39.4 1.3
26.4	52.60 .17	67.3 1.7	10.00 .15	74.5 1.3	56.13 .33	52.0 2.4	54.02 .13	40.5 1.0
Oct. 6.3	52.41 .20	68.8 1.3	9.83 .17	75.6 1.0	55.78 .37	54.1 2.0	53.89 .15	41.3 0.7
16.3	52.20 .21	69.9 0.8	9.65 .19	76.4 0.6	55.39 .40	55.9 1.5	53.73 .16	41.9 +0.4
26.3	51.99 −.22	70.5 +0.4	9.46 −.20	76.8 +0.2	54.97 −.43	57.1 +1.0	53.56 −.17	42.1 0.0
Nov. 5.3	51.77 .22	70.7 −0.1	9.26 .19	76.8 −0.2	54.53 .43	57.8 +0.4	53.39 .17	41.9 −0.3
15.2	51.55 .21	70.4 0.5	9.07 .18	76.4 0.6	54.10 .43	58.0 −0.1	53.23 .16	41.5 0.6
25.2	51.36 .19	69.6 1.0	8.89 .17	75.6 1.0	53.67 .41	57.6 0.7	53.07 .14	40.7 0.9
Dec. 5.2	51.18 .16	68.4 1.4	8.73 .15	74.4 1.4	53.27 .38	56.6 1.3	52.94 .12	39.7 1.2
15.1	51.03 −.13	66.8 −1.8	8.60 −.12	72.8 −1.7	52.90 −.34	55.0 −1.8	52.83 −.10	38.3 −1.4
25.1	50.91 .10	64.8 2.1	8.49 .09	71.0 2.0	52.59 .29	53.0 2.3	52.74 .08	36.8 1.7
35.1	50.83 −.06	62.5 −2.4	8.42 −.05	68.8 −2.2	52.32 −.23	50.5 −2.7	52.67 −.06	35.0 −1.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Aquarii.		β Cephei.		ξ Aquarii.		ε Pegasi.	
	Right Ascension	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	$21^{h}\ 25^{m}$	$-6^{\circ}\ 3'$	$21^{h}\ 27^{m}$	$+70^{\circ}\ 3'$	$21^{h}\ 31^{m}$	$-8^{\circ}\ 21'$	$21^{h}\ 38^{m}$	$+9^{\circ}\ 21'$
	s	″	s	″	s	″	s	″
Jan. 0.1	35.04 −.04	64.4 −0.7	10.09 −.41	68.1 −2.4	42.62 −.04	38.8 −0.6	36.81 −.06	29.5 −1.3
10.1	35.01 −.01	65.1 0.6	9.72 .32	65.4 2.8	42.59 −.01	39.4 0.5	36.77 −.03	28.1 1.4
20.1	35.02 +.02	65.7 0.6	9.45 .22	62.4 3.1	42.59 +.02	39.9 0.4	36.75 .00	26.7 1.4
30.0	35.05 .05	66.2 0.5	9.27 −.11	59.2 3.3	42.62 .05	40.2 0.3	36.76 +.03	25.4 1.3
Feb. 9.0	35.12 .08	66.6 0.3	9.21 .00	55.9 3.3	42.68 .08	40.5 −0.2	36.81 .06	24.1 1.2
19.0	35.22 +.11	66.9 −0.1	9.27 +.12	52.5 −3.3	42.77 +.11	40.6 0.0	36.89 +.09	23.0 −1.0
28.9	35.34 .14	66.9 +0.1	9.45 .23	49.3 3.1	42.90 .14	40.5 +0.2	36.99 .12	22.0 0.8
Mar. 10.9	35.50 .17	66.7 0.3	9.73 .34	46.4 2.8	43.05 .17	40.1 0.4	37.13 .16	21.4 0.5
20.9	35.69 .20	66.3 0.5	10.12 .44	43.8 2.3	43.23 .20	39.6 0.6	37.31 .19	21.0 −0.2
30.9	35.90 .23	65.7 0.8	10.61 .52	41.7 1.8	43.44 .22	38.9 0.9	37.51 .22	20.9 +0.2
Apr. 9.8	36.14 +.25	64.8 +1.0	11.17 +.59	40.2 −1.3	43.68 +.25	37.9 +1.1	37.74 +.24	21.2 +0.5
19.8	36.40 .27	63.7 1.2	11.78 .64	39.2 −0.7	43.94 .27	36.7 1.3	37.99 .27	21.9 0.8
29.8	36.69 .29	62.4 1.4	12.44 .67	38.8 0.0	44.22 .29	35.3 1.4	38.27 .28	22.9 1.1
May 9.8	36.98 .30	60.9 1.5	13.12 .67	39.1 +0.6	44.52 .30	33.8 1.6	38.56 .29	24.2 1.4
19.7	37.28 .30	59.3 1.6	13.79 .66	40.0 1.2	44.82 .30	32.2 1.6	38.86 .30	25.8 1.7
29.7	37.58 +.30	57.6 +1.7	14.44 +.63	41.4 +1.7	45.13 +.30	30.5 +1.7	39.16 +.30	27.6 +1.9
June 8.7	37.88 .29	55.9 1.7	15.05 .58	43.4 2.2	45.43 .29	28.9 1.6	39.46 .29	29.6 2.0
18.6	38.16 .27	54.3 1.6	15.60 .51	45.9 2.6	45.71 .28	27.2 1.6	39.74 .27	31.6 2.1
28.6	38.42 .25	52.7 1.5	16.07 .43	48.7 3.0	45.98 .25	25.7 1.4	40.00 .25	33.8 2.1
July 8.6	38.65 .21	51.2 1.4	16.46 .34	51.9 3.3	46.22 .22	24.3 1.3	40.23 .22	35.9 2.1
18.6	38.85 +.18	49.9 +1.2	16.76 +.24	55.3 +3.5	46.42 +.18	23.1 +1.1	40.43 +.18	38.0 +2.0
28.5	39.01 .14	48.7 1.0	16.95 .14	58.8 3.6	46.59 .14	22.1 0.9	40.59 .14	39.9 1.9
Aug. 7.5	39.12 .09	47.8 0.8	17.03 +.03	62.5 3.6	46.71 .10	21.2 0.7	40.71 .10	41.8 1.7
17.5	39.19 +.05	47.1 0.6	17.01 −.08	66.1 3.6	46.79 +.05	20.6 0.5	40.78 .05	43.4 1.5
27.5	39.22 .00	46.6 0.4	16.88 .18	69.5 3.4	46.82 −.01	20.2 0.3	40.81 +.01	44.8 1.3
Sept. 6.4	39.20 −.04	46.2 +0.2	16.65 −.28	73.0 +3.3	46.81 −.03	20.1 +0.1	40.80 −.03	46.0 +1.1
16.4	39.15 .07	46.1 0.0	16.32 .36	76.1 3.0	46.76 .07	20.0 −0.1	40.75 .07	47.0 0.9
26.4	39.06 .10	46.2 −0.1	15.92 .44	78.9 2.7	46.67 .10	20.2 0.2	40.67 .10	47.7 0.6
Oct. 6.3	38.94 .13	46.4 0.3	15.44 .51	81.4 2.3	46.56 .12	20.5 0.4	40.55 .12	48.2 0.4
16.3	38.80 .14	46.7 0.4	14.90 .56	83.5 1.8	46.43 .14	20.9 0.5	40.42 .14	48.5 +0.1
26.3	38.66 −.15	47.1 −0.5	14.31 −.60	85.0 +1.3	46.28 −.15	21.4 −0.5	40.28 −.15	48.4 −0.1
Nov. 5.3	38.51 .15	47.7 0.6	13.70 .62	86.1 0.8	46.13 .15	22.0 0.6	40.12 .15	48.2 0.3
15.2	38.36 .14	48.3 0.6	13.08 .62	86.5 +0.2	45.99 .14	22.6 0.6	39.98 .14	47.8 0.6
25.2	38.23 .12	48.9 0.7	12.46 .61	86.4 −0.4	45.86 .12	23.2 0.7	39.84 .13	47.1 0.8
Dec. 5.2	38.12 .10	49.6 0.7	11.86 .58	85.7 1.0	45.74 .11	23.9 0.6	39.71 .12	46.2 1.0
15.2	38.02 −.08	50.3 −0.7	11.30 −.54	84.4 −1.6	45.64 −.08	24.5 −0.6	39.60 −.10	45.2 −1.1
25.1	37.95 .05	51.0 0.7	10.80 .46	82.6 2.1	45.57 .06	25.2 0.6	39.52 .07	44.0 1.3
35.1	37.91 −.03	51.7 −0.7	10.37 −.39	80.2 −2.6	45.53 −.03	25.8 −0.5	39.46 −.04	42.7 −1.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	11 Cephei.		μ Capricorni.		79 Draconis.		α Aquarii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	21h 40m	+70° 47′	21h 47m	−14° 4′	21h 51m	+73° 9′	21h 59m	− 0° 51′
	s	″	s	″	s	″	s	″
Jan. 0.1	14.25 −.46	44.0 −2.2	6.50 −.05	63.0 −0.3	25.82 −.56	80.1 −2.1	57.43 −.07	66.8 −0.9
10.1	13.84 .37	41 6 2.7	6.46 −.03	63.2 0.2	25.31 .46	77.7 2.5	57.37 .04	67.6 0.8
20.1	13.51 .27	38.7 3.0	6.45 .00	63.4 −0.1	24.91 .35	75.0 2.9	57.35 −.01	68.5 0.8
30.0	13.30 .16	35.6 3.2	6.47 +.03	63.4 +0.1	24.61 .23	71.9 3.2	57.35 +.01	69.2 0.7
Feb. 9.0	13.20 −.04	32.2 3.3	6.52 .06	63.2 0.2	24.45 −.09	68.7 3.3	57.38 .04	69.9 0.6
19.0	13.22 +.08	28.9 −3.3	6.60 +.10	62.9 +0.4	24.43 +.05	65.3 −3.3	57.44 +.07	70.4 −0.4
Mar. 1.0	13.36 .20	25.7 3.1	6.71 .13	62.4 0.6	24.55 .18	62.1 3.2	57.53 .11	70.6 −0.2
10.9	13.62 .32	22.7 2.8	6.85 .16	61.7 0.8	24.80 .32	59.0 2.9	57.65 .14	70.7 +0.1
20.9	13.99 .42	20.0 2.4	7.02 .19	60.9 1.0	25.18 .44	56.2 2.6	57.80 .17	70.5 0.3
30.9	14.47 .51	17.8 2.0	7.23 .22	59.8 1.2	25.68 .55	53.8 2.1	57.99 .20	70.1 0.6
Apr. 9.9	15.02 +.59	16.1 −1.4	7.46 +.24	58.5 +1.3	26.28 +.64	52.0 −1.6	58.20 +.23	69.3 +0.9
19.8	15.65 .65	14.9 0.8	7.72 .27	57.1 1.5	26.96 .71	50.7 1.0	58.44 .25	68.3 1.1
29.8	16.31 .68	14.4 −0.2	8.00 .29	55.6 1.6	27.70 .76	49.9 −0.4	58.71 .28	67.1 1.4
May 9.8	17.01 .70	14.5 +0.4	8.29 .30	54.0 1.6	28.47 .78	49.8 +0.2	58.99 .29	65.6 1.6
19.7	17.71 .69	15.2 1.0	8.60 .31	52.3 1.7	29.26 .78	50.4 0.8	59.29 .30	64.0 1.7
29.7	18.39 +.66	16.5 +1.6	8.91 +.31	50.7 +1.6	30.03 +.75	51.5 +1.4	59.59 +.30	62.2 +1.8
June 8.7	19.03 .62	18.3 2.1	9.23 .31	49.1 1.6	30.76 .70	53.2 1.9	59.90 .30	60.4 1.9
18.7	19.62 .55	20.7 2.5	9.53 .29	47.5 1.4	31.44 .64	55.3 2.4	60.19 .28	58.5 1.9
28.6	20.14 .47	23.4 2.9	9.81 .27	46.2 1.3	32.04 .55	57.9 2.8	60.46 .26	56.6 1.8
July 8.6	20.57 .38	26.5 3.2	10.06 .24	45.0 1.1	32.54 .45	60.9 3.1	60.71 .24	54.9 1.7
18.6	20.91 +.28	29.8 +3.4	10.28 +.20	44.0 +0.9	32.94 +.34	64.2 +3.4	60.93 +.20	53.2 +1.6
28.6	21.14 .18	33.3 3.6	10.47 .16	43.2 0.7	33.23 .23	67.7 3.5	61.12 .16	51.7 1.4
Aug. 7.5	21.26 +.07	37.0 3.6	10.61 .12	42.7 0.4	33.40 +.10	71.3 3.6	61.26 .12	50.4 1.2
17.5	21.28 −.04	40.6 3.6	10.70 .07	42.4 +0.2	33.44 −.02	75.0 3.7	61.36 .08	49.3 1.0
27.5	21.18 .15	44.2 3.5	10.75 +.03	42.3 0.0	33.36 .14	78.6 3.6	61.42 +.04	48.4 0.8
Sept. 6.4	20.98 −.25	47.7 +3.4	10 76 −.02	42.4 −0.2	33.16 −.25	82.1 +3.4	61.43 −.01	47.7 +0.6
16.4	20.68 .34	50.9 3.1	10.72 05	42.7 0.4	32.85 .36	85.5 3.2	61.40 .04	47.3 0.3
26.4	20.30 .43	53.9 2.8	10.65 .09	43.2 0.5	32.44 .46	88.6 2.9	61.34 .08	47.1 +0.1
Oct. 6.4	19.83 .50	56.5 2.4	10.55 .11	43.7 0.6	31.93 .55	91.4 2.6	61.25 .10	47.0 −0.1
16.3	19.30 .56	58.7 2.0	10.43 .13	44.4 0.7	31.35 .62	93.8 2.2	61.14 .12	47.2 0.2
26.3	18.71 −.60	60.5 +1.5	10.29 −.14	45.1 −0.7	30.70 −.67	95.7 +1.7	61.01 −.13	47.5 −0.4
Nov. 5.3	18.09 .63	61.7 1.0	10.14 .15	45.8 0.7	30.00 .71	97.1 1.2	60.87 .14	47.9 0.5
15.3	17.45 .64	62.4 +0.4	9.99 .14	46.4 0.7	29.28 .73	98.1 +0.6	60.73 .14	48.4 0.6
25.2	16.81 .63	62.5 −0.2	9.86 .13	47.1 0.6	28.54 .73	98.4 0.0	60.60 .13	49.1 0.7
Dec. 5.2	16.19 .61	62.0 0.8	9.74 .11	47.6 0.5	27.82 .71	98.1 −0.6	60.47 .11	49.8 0.8
15.2	15.60 −.56	60.9 −1.4	9.63 −.09	48.2 −0.5	27.12 −.67	97.2 −1.2	60.37 −.10	50.6 −0.8
25.1	15.06 .50	59.2 1.9	9.55 .07	48.6 0.4	26.48 .61	95.7 1.8	60.28 .08	51.5 0.8
35.1	14.59 −.43	57.0 −2.4	9.50 −.04	48.9 −0.3	25.91 −.52	93.6 −2.3	60.21 −.05	52.3 −0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Gruis.		θ Aquarii.		π Aquarii.		η Aquarii.	
	Right Ascension.	Declination *South*.	Right Ascension.	Declination *South*.	Right Ascension.	Declination *North*.	Right Ascension.	Declination *South*.
	$22^{h}\ 1^{m}$	$-47^{\circ}\ 30'$	$22^{h}\ 10^{m}$	$-\ 8^{\circ}\ 20'$	$22^{h}\ 19^{m}$	$+\ 0^{\circ}\ 48'$	$22^{h}\ 29^{m}$	$-\ 0^{\circ}\ 41'$
	s	″	s	″	s	″	s	″
Jan. 0.1	4.04 −.12	38.7 +1.2	50.83 −.07	47.1 −0.6	29.12 −.08	14.8 −0.9	31.75 −.08	60.2 −0.8
10.1	3.95 .07	37.3 1.5	50.77 .05	47.6 0.5	29.06 .05	14.0 0.9	31.68 .06	61.0 0.8
20.1	3.89 −.03	35.7 1.8	50.74 −.02	48.1 0.4	29.01 .03	13.1 0.8	31.63 .04	61.8 0.7
30.1	3.89 +.01	33.8 2.0	50.74 +.01	48.4 0.2	28.99 −.01	12.3 0.8	31.60 −.01	62.5 0.7
Feb. 9.0	3.92 .06	31.6 2.2	50.76 .04	48.5 −0.1	29.00 +.02	11.6 0.6	31.60 +.02	63.1 0.5
19.0	4.01 +.11	29.3 +2.3	50.81 +.07	48.6 +0.1	29.04 +.05	11.0 −0.5	31.63 +.04	63.6 −0.4
Mar. 1.0	4.14 .15	26.9 2.4	50.89 .10	48.4 0.3	29.11 .09	10.7 −0.3	31.69 .07	63.8 −0.2
11.0	4.31 .20	24.4 2.5	51.01 .13	48.0 0.5	29.21 .12	10.5 0.0	31.79 .11	63.9 +0.1
20.9	4.53 .24	21.9 2.5	51.15 .16	47.4 0.7	29.35 .15	10.6 +0.2	31.91 .14	63.7 0.3
30.9	4.79 .29	19.4 2.4	51.33 .19	46.5 1.0	29.51 .18	11.0 0.5	32.07 .18	63.2 0.6
Apr. 9.9	5.09 +.32	17.0 +2.3	51.54 +.22	45.4 +1.2	29.71 +.21	11.7 +0.8	32.26 +.21	62.5 +0.9
19.8	5.43 .35	14.7 2.2	51.78 .25	44.2 1.4	29.94 .24	12.6 1.1	32.49 .24	61.5 1.1
29.8	5.80 .38	12.6 2.0	52.04 .27	42.7 1.5	30.20 .27	13.8 1.3	32.74 .26	60.2 1.4
May 9.8	6.19 .40	10.7 1.8	52.33 .29	41.1 1.7	30.48 .29	15.3 1.5	33.01 .28	58.7 1.6
19.8	6.60 .42	9.1 1.5	52.63 .30	39.4 1.7	30.77 .30	16.9 1.7	33.30 .30	57.1 1.7
29.7	7.02 +.42	7.8 +1.1	52.93 +.31	37.6 +1.8	31.07 +.30	18.7 +1.8	33.61 +.30	55.2 +1.8
June 8.7	7.45 .41	6.8 0.8	53.24 .30	35.8 1.8	31.38 .30	20.6 1.9	33.91 .30	53.4 1.9
18.7	7.85 .40	6.2 +0.4	53.54 .29	34.0 1.7	31.68 .29	22.5 1.9	34.21 .29	51.4 1.9
28.6	8.24 .37	6.0 0.0	53.83 .27	32.4 1.6	31.96 .27	24.4 1.9	34.50 .28	49.5 1.9
July 8.6	8.60 .33	6.2 −0.4	54.09 .25	30.9 1.4	32.22 .25	26.3 1.8	34.77 .25	47.7 1.8
18.6	8.91 +.29	6.8 −0.8	54.32 +.22	29.5 +1.2	32.45 +.21	28.1 +1.7	35.01 +.22	46.0 +1.6
28.6	9.18 .24	7.7 1.1	54.52 .18	28.4 1.0	32.65 .18	29.7 1.5	35.21 .19	44.4 1.5
Aug. 7.5	9.38 .18	9.0 1.4	54.68 .14	27.5 0.8	32.81 .14	31.1 1.3	35.38 .15	43.0 1.3
17.5	9.53 .11	10.5 1.7	54.79 .09	26.8 0.6	32.93 .10	32.4 1.1	35.51 .11	41.9 1.0
27.5	9.61 +.05	12.3 1.8	54.86 .05	26.3 0.3	33.00 .05	33.4 0.9	35.60 .06	40.9 0.8
Sept. 6.5	9.63 −.01	14.2 −2.0	54.89 +.01	26.1 +0.1	33.04 +.01	34.2 +0.7	35.64 +.02	40.2 +0.6
16.4	9.59 .07	16.2 2.0	54.88 −.03	26.1 −0.1	33.03 −.03	34.7 0.5	35.64 −.02	39.7 0.4
26.4	9.49 .12	18.2 1.9	54.83 .07	26.2 0.2	32.98 .06	35.1 +0.2	35.61 .05	39.5 +0.2
Oct. 6.4	9.35 .16	20.1 1.8	54.74 .09	26.5 0.4	32.91 .09	35.2 0.0	35.54 .08	39.4 0.0
16.3	9.16 .20	21.8 1.6	54.64 .12	27.0 0.5	32.81 .11	35.2 −0.1	35.45 .10	39.5 −0.2
26.3	8.95 −.22	23.3 −1.3	54.51 −.13	27.5 −0.6	32.69 −.12	34.9 −0.3	35.34 −.12	39.8 −0.4
Nov. 5.3	8.72 .23	24.5 1.0	54.38 .14	28.2 0.6	32.56 .13	34.6 0.4	35.21 .13	40.2 0.5
15.3	8.49 .23	25.3 0.6	54.24 .13	27.8 0.7	32.43 .13	34.1 0.6	35.08 .13	40.8 0.6
25.2	8.26 .22	25.7 −0.2	54.11 .13	29.5 0.7	32.30 .13	33.4 0.7	34.95 .13	41.4 0.7
Dec. 5.2	8.05 .20	25.8 +0.2	53.98 .12	30.2 0.7	32.17 .12	32.7 0.8	34.83 .12	42.1 0.7
15.2	7.86 −.17	25.4 +0.6	53.87 −.10	30.8 −0.7	32.06 −.10	31.9 −0.8	34.71 −.11	42.9 −0.8
25.2	7.71 .13	24.6 1.0	53.78 .08	31.5 0.6	31.96 .09	31.0 0.9	34.62 .09	43.7 0.8
35.1	7.60 −.10	23.5 +1.3	53.71 −.06	32.0 −0.5	31.88 −.07	30.2 −0.9	34.53 −.07	44.5 −0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	226 Cephei (B.)		ζ Pegasi.		ι Cephei.		λ Aquarii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 22 30	+75° 38′	h m 22 35	+10° 14′	h m 22 45	+65° 36′	h m 22 46	− 8° 10′
	s	″	s	″	s	″	s	″
Jan. 0.2	16.31 −.76	55.5 −1.5	48.51 −.09	31.9 −1.1	38.75 −.42	37.5 −1.5	41.95 −.09	54.7 −0.6
10.1	15.61 .65	53.7 2.1	48.42 .07	30.7 1.2	38.35 .37	35.7 2.0	41.86 .07	55.2 0.5
20.1	15.01 .54	51.3 2.5	48.36 .05	29.5 1.2	38.01 .31	33.5 2.4	41.80 .05	55.6 0.4
30.1	14.53 .41	48.6 2.9	48.32 −.02	28.2 1.2	37.73 .24	30.9 2.8	41.77 −.03	55.9 0.2
Feb. 9.0	14.19 .26	45.5 3.1	48.31 .00	27.1 1.1	37.53 .16	28.0 3.0	41.75 .00	56.1 −0.1
19.0	14.00 −.11	42.3 −3.2	48.33 +.03	26.0 −1.0	37.42 −.07	24.9 −3.1	41.77 +.03	56.0 +0.1
Mar. 1.0	13.98 +.06	39.0 3.2	48.38 .06	25.1 0.8	37.39 +.02	21.7 3.1	41.81 .06	55.8 0.3
11.0	14.12 .22	35.8 3.1	48.46 .10	24.4 0.6	37.47 .12	18.7 3.0	41.89 .09	55.4 0.5
20.9	14.42 .38	32.8 2.8	48.58 .14	23.9 −0.3	37.63 .21	15.8 2.7	42.00 .13	54.7 0.8
30.9	14.87 .52	30.2 2.5	48.73 .17	23.8 0.0	37.89 .30	13.2 2.4	42.14 .16	53.8 1.0
Apr. 9.9	15.46 +.65	27.9 −2.0	48.92 +.20	24.0 +0.4	38.24 +.38	11.0 −1.9	42.32 +.20	52.7 +1.2
19.9	16.17 .75	26.1 1.5	49.14 .23	24.5 0.7	38.67 .45	9.4 1.4	42.53 .23	51.3 1.4
29.8	16.96 .83	24.9 0.9	49.39 .26	25.4 1.0	39.15 .51	8.2 0.9	42.78 .26	49.8 1.6
May 9.8	17.82 .88	24.3 −0.3	49.66 .28	26.6 1.3	39.69 .55	7.7 −0.3	43.05 .28	48.1 1.7
19.8	18.72 .90	24.2 +0.3	49.96 .30	28.1 1.6	40.26 .57	7.7 +0.3	43.33 .30	46.3 1.8
29.7	19.63 +.90	24.8 +0.9	50.26 +.31	29.8 +1.8	40.84 +.58	8.3 +0.9	43.64 +.31	44.4 +1.9
June 8.7	20.51 .87	26.0 1.4	50.57 .30	31.7 2.0	41.42 .57	9.4 1.4	43.95 .31	42.5 1.9
18.7	21.36 81	27.7 1.9	50.87 .30	33.7 2.1	41.98 .54	11.2 1.9	44.26 .30	40.7 1.8
28.7	22.13 .73	29.8 2.4	51.16 .28	35.9 2.2	42.51 .50	13.3 2.4	44.55 .29	38.9 1.7
July 8.6	22.82 .63	32.5 2.8	51.43 .26	38.0 2.1	42.99 .45	15.9 2.8	44.84 .27	37.3 1.6
18.6	23.40 +.52	35.5 +3.1	51.67 +.23	40.2 +2.1	43.41 +.38	18.9 +3.1	45.09 +.24	35.8 +1.4
28.6	23.86 .40	38.8 3.4	51.88 .19	42.2 2.0	43.75 .31	22.1 3.3	45.32 .21	34.5 1.0
Aug. 7.6	24.20 .27	42.3 3.6	52.05 .15	44.2 1.7	44.02 .23	25.6 3.5	45.50 .17	33.5 0.9
17.5	24.39 +.13	45.9 3.7	52.18 .11	45.9 1.7	44.21 .14	29.1 3.6	45.65 .13	32.7 0.7
27.5	24.45 −.01	49.6 3.7	52.26 .07	47.5 1.5	44.31 +.06	32.7 3.6	45.76 .08	32.2 0.4
Sept. 6.5	24.38 −.15	53.3 +3.6	52.31 +.02	48.9 +1.2	44.33 −.02	36.3 +3.5	45.82 +.04	31.9 +0.2
16.4	24.16 .27	56.9 3.5	52.31 −.01	50.0 1.0	44.27 .10	39.8 3.4	45.84 .00	31.8 −0.1
26.4	23.82 .40	60.3 3.3	52.28 .05	50.9 0.8	44.13 .18	43.1 3.2	45.82 −.03	32.0 0.2
Oct. 6.4	23.37 .51	63.5 3.0	52.22 .08	51.5 0.5	43.91 .25	46.2 2.9	45.77 .06	32.3 0.4
16.4	22.80 .61	66.4 2.7	52.13 .10	51.9 0.3	43.63 .31	49.0 2.6	45.69 .09	32.8 0.5
26.3	22.15 −.70	68.8 +2.2	52.02 −.12	52.1 +0.1	43.29 −.36	51.4 +2.2	45.59 −.11	33.4 −0.6
Nov. 5.3	21.41 .76	70.9 1.8	51.89 .13	52.1 −0.2	42.90 .41	53.3 1.7	45.47 .12	34.1 0.7
15.3	20.62 .81	72.3 1.2	51.76 .13	51.8 0.4	42.47 .44	54.7 1.2	45.35 .13	34.8 0.7
25.3	19.78 .84	73.3 +0.6	51.63 .13	51.3 0.6	42.03 .45	55.6 +0.6	45.22 .13	35.5 0.7
Dec. 5.2	18.94 .85	73.6 0.0	51.50 .13	50.7 0.7	41.57 .46	56.0 0.0	45.10 .12	36.2 0.7
15.2	18.09 −.83	73.3 −0.6	51.37 −.12	49.8 −0.9	41.11 −.45	55.7 −0.6	44.98 −.11	36.9 −0.7
25.2	17.28 .78	72.4 1.2	51.27 .10	48.8 1.0	40.66 .43	54.9 1.1	44.87 .10	37.6 0.6
35.1	16.53 −.71	71.0 −1.8	51.17 −.08	47.7 −1.1	40.24 −.40	53.4 −1.7	44.78 −.08	38.2 −0.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Piscis Australis. (*Fomalhaut.*)		α Pegasi. (*Markab.*)		ο Cephei.		θ Piscium.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 22 51	° ′ −30 12	h m 22 59	° ′ +14 35	h m 23 13	° ′ +67 29	h m 23 22	° ′ + 5 45
d	s	″	s	″	s	″	s	″
Jan. 0.2	22.75 −.11	86.3 +0.1	7.01 −.11	52.9 −1.1	59.03 −.47	51.8 −1.1	13.28 −.11	28.4 −0.9
10.2	22.65 .09	86.0 0.4	6.91 .09	51.7 1.2	58.57 .44	50.4 1.6	13.18 .10	27.5 0.9
20.1	22.57 .06	85.4 0.7	6.83 .07	50.4 1.3	58.16 .38	48.5 2.1	13.09 .08	26.6 0.9
30.1	22.52 −.03	84.5 1.0	6.77 .05	49.1 1.3	57.81 .32	46.2 2.5	13.02 .06	25.7 0.9
Feb. 9.1	22.50 .00	83.4 1.2	6.73 −.02	47.7 1.3	57.52 .24	43.5 2.8	12.96 .04	24.8 0.8
19.0	22.51 +.03	82.1 +1.5	6.72 +.01	46.5 −1.2	57.33 −.15	40.5 −3.0	12.94 −.01	24.1 −0.7
Mar. 1.0	22.56 .06	80.5 1.7	6.75 .04	45.3 1.0	57.23 −.05	37.4 3.1	12.94 +.02	23.5 0.5
11.0	22.64 .10	78.7 1.8	6.80 .08	44.4 0.8	57.23 +.06	34.4 3.0	12.98 .05	23.1 −0.2
21.0	22.76 .14	76.8 2.0	6.90 .11	43.7 0.5	57.34 .16	31.4 2.9	13.05 .09	23.0 0.0
30.9	22.92 .18	74.7 2.1	7.03 .15	43.4 −0.2	57.56 .26	28.6 2.6	13.16 .13	23.1 +0.3
Apr. 9.9	23.11 +.21	72.6 +2.2	7.20 +.19	43.3 +0.1	57.87 +.36	26.2 −2.2	13.31 +.16	23.5 +0.5
19.9	23.35 .25	70.4 2.2	7.41 .22	43.6 0.5	58.27 .44	24.3 1.7	13.49 .20	24.2 0.8
29.9	23.61 .28	68.2 2.2	7.65 .25	44.2 0.8	58.75 .51	22.8 1.2	13.71 .23	25.1 1.1
May 9.8	23.91 .31	66.0 2.1	7.91 .28	45.2 1.2	59.30 .57	21.9 0.6	13.95 .26	26.4 1.4
19.8	24.23 .33	63.9 2.0	8.20 .30	46.5 1.5	59.89 .60	21.5 −0.1	14.23 .28	27.9 1.6
29.8	24.56 +.34	62.0 +1.9	8.51 +.31	48.1 +1.7	60.51 +.62	21.7 +0.5	14.52 +.30	29.6 +1.8
June 8.7	24.91 .35	60.2 1.6	8.82 .31	50.0 1.9	61.13 .62	22.5 1.1	14.83 .31	31.5 1.9
18.7	25.25 .34	58.7 1.4	9.13 .30	52.0 2.1	61.75 .61	23.9 1.6	15.13 .30	33.5 2.0
28.7	25.59 .33	57.5 1.1	9.43 .29	54.1 2.2	62.35 .57	25.7 2.1	15.44 .30	35.5 2.0
July 8.7	25.91 .31	56.5 0.8	9.71 .27	56.4 2.3	62.90 .52	28.0 2.5	15.72 .28	37.5 2.0
18.6	26.20 +.28	56.0 +0.4	9.97 +.24	58.6 +2.2	63.40 +.46	30.7 +2.9	15.99 +.26	39.5 +1.9
28.6	26.46 .24	55.7 +0.1	10.19 .21	60.8 2.2	63.82 .39	33.8 3.2	16.23 .23	41.4 1.8
Aug. 7.6	26.68 .20	55.8 −0.3	10.38 .17	63.0 2.1	64.18 .31	37.1 3.4	16.44 .19	43.2 1.7
17.6	26.85 .15	56.3 0.6	10.54 .13	65.0 1.9	64.45 .23	40.6 3.5	16.62 .15	44.8 1.5
27.5	26.98 .10	57.0 0.9	10.64 .09	66.8 1.7	64.63 .14	44.1 3.6	16.75 .11	46.1 1.3
Sept. 6.5	27.05 +.05	58.0 −1.1	10.71 +.05	68.4 +1.5	64.73 +.05	47.8 +3.6	16.84 +.07	47.3 +1.0
16.5	27.08 +.01	59.2 1.3	10.74 +.01	69.8 1.3	64.73 −.04	51.4 3.5	16.89 +.03	48.2 0.8
26.5	27.07 −.04	60.6 1.4	10.73 −.03	71.0 1.1	64.65 .12	54.9 3.4	16.91 .00	48.9 0.6
Oct. 6.4	27.01 .08	62.1 1.5	10.68 .06	71.9 0.8	64.49 .20	58.1 3.2	16.89 −.03	49.3 0.4
16.4	26.91 .11	63.5 1.5	10.61 .08	72.6 0.6	64.25 .27	61.2 2.9	16.84 .06	49.6 +0.1
26.4	26.80 −.13	65.0 −1.4	10.51 −.10	73.1 +0.3	63.95 −.34	63.9 +2.5	16.77 −.08	49.6 −0.1
Nov. 5.3	26.66 .15	66.3 1.3	10.40 .12	73.2 0.0	63.58 .39	66.2 2.1	16.68 .10	49.5 0.2
15.3	26.50 .15	67.4 1.1	10.27 .13	73.2 −0.2	63.17 .44	68.0 1.6	16.57 .11	49.1 0.4
25.3	26.35 .15	68.4 0.8	10.14 .13	72.9 0.4	62.71 .47	69.3 1.0	16.45 .12	48.7 0.5
Dec. 5.3	26.20 .15	69.1 0.6	10.01 .13	72.3 0.6	62.23 .49	70.1 +0.5	16.34 .12	48.1 0.7
15.2	26.05 −.14	69.5 −0.3	9.89 −.12	71.6 −0.8	61.73 −.50	70.3 −0.1	16.22 −.12	47.4 −0.8
25.2	25.92 .12	69.7 0.0	9.77 .11	70.6 1.0	61.24 .49	69.9 0.7	16.10 .11	46.6 0.8
35.2	25.81 −.10	69.5 +0.3	9.66 −.10	69.5 −1.2	60.76 −.47	68.8 −1.3	15.99 −.10	45.7 −0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ι Piscium.		γ Cephei.		Groombridge 4163.		ω Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 23 34	° ′ + 5 0	h m 23 34	° ′ +76 59	h m 23 49	° ′ +73 46	h m 23 53	° ′ + 6 14
	s	″	s	″	s	″	s	″
Jan. 0.2	7.48 −.11	48.0 −0.8	43.16 −.89	82.3 −0.6	21.10 −.70	69.2 −0.5	29.84 −.11	13.4 −0.8
10.2	7.38 .10	47.1 0.9	42.28 .85	81.3 1.2	20.41 .67	68.4 1.1	29.73 .11	12.5 0.8
20.2	7.28 .09	46.2 0.9	41.47 .77	79.8 1.8	19.76 .62	67.0 1.7	29.62 .10	11.7 0.9
30.1	7.20 .07	45.3 0.8	40.74 .66	77.7 2.3	19.16 .56	65.1 2.1	29.53 .08	10.8 0.8
Feb. 9.1	7.14 .05	44.6 0.7	40.14 .53	75.2 2.7	18.66 .45	62.7 2.6	29.45 .06	10.0 0.7
19.1	7.11 −.02	43.9 −0.6	39.68 −.38	72.4 −3.0	18.26 −.33	60.0 −2.9	29.40 −.04	9.3 −0.6
Mar. 1.1	7.10 +.01	43.3 0.4	39.38 .21	69.3 3.1	17.99 .20	57.0 3.0	29.37 −.01	8.8 0.5
11.0	7.13 .04	43.0 −0.2	39.26 −.03	66.2 3.2	17.86 −.07	53.9 3.1	29.38 +.02	8.4 0.3
21.0	7.19 .08	42.9 0.0	39.32 +.15	63.0 3.1	17.87 +.08	50.8 3.0	29.42 .06	8.2 −0.1
30.9	7.29 .12	43.0 +0.3	39.57 .33	60.0 2.9	18.03 .24	47.8 2.8	29.50 .10	8.3 +0.2
Apr. 9.9	7.42 +.15	43.5 +0.6	39.98 +.50	57.3 −2.6	18.33 +.37	45.1 −2.6	29.61 +.14	8.6 +0.5
19.9	7.60 .19	44.2 0.9	40.56 .65	54.9 2.1	18.77 .49	42.7 2.2	29.77 .18	9.3 0.8
29.9	7.80 .23	45.2 1.1	41.28 .77	53.0 1.7	19.32 .61	40.7 1.7	29.96 .21	10.2 1.1
May 9.9	8.05 .26	46.4 1.4	42.11 .87	51.6 1.1	19.98 .70	39.2 1.2	30.19 .24	11.4 1.3
19.8	8.32 .28	47.9 1.6	43.03 .95	50.8 −0.6	20.71 .76	38.3 0.7	30.45 .27	12.8 1.5
29.8	8.61 +.30	49.6 +1.8	44.00 +.99	50.5 0.0	21.51 +.81	37.9 −0.1	30.74 +.29	14.4 +1.7
June 8.8	8.91 .31	51.5 1.9	45.00 1.00	50.8 +0.6	22.33 .83	38.1 +0.5	31.04 .30	16.3 1.9
18.7	9.22 .31	53.4 2.0	46.00 .98	51.7 1.2	23.16 .82	38.9 1.0	31.34 .31	18.2 2.0
28.7	9.52 .30	55.4 2.0	46.97 .94	53.1 1.7	23.98 .80	40.2 1.6	31.65 .30	20.2 2.0
July 8.7	9.82 .28	57.5 2.0	47.88 .87	55.0 2.2	24.76 .75	42.0 2.0	31.95 .29	22.2 2.0
18.7	10.09 +.26	59.4 +1.9	48.72 +.79	57.4 +2.6	25.48 +.68	44.3 +2.5	32.23 +.27	24.2 +1.9
28.6	10.34 .24	61.3 1.8	49.45 .68	60.2 2.9	26.13 .60	47.0 2.9	32.50 .25	26.1 1.8
Aug. 7.6	10.56 .20	63.0 1.6	50.07 .56	63.3 3.3	26.69 .51	50.0 3.2	32.73 .22	27.9 1.7
17.6	10.74 .16	64.5 1.4	50.57 .43	66.7 3.5	27.15 .40	53.3 3.4	32.93 .18	29.5 1.5
27.6	10.89 .12	65.9 1.2	50.92 .29	70.3 3.6	27.50 .30	56.8 3.6	33.09 .14	30.9 1.3
Sept. 6.5	10.99 +.08	67.0 +1.0	51.14 +.14	74.0 +3.7	27.74 +.18	60.4 +3.7	33.21 +.10	32.1 +1.1
16.5	11.06 .05	67.8 0.8	51.21 .00	77.7 3.7	27.87 +.07	64.1 3.7	33.30 .07	33.1 0.8
26.5	11.09 +.01	68.5 0.5	51.13 −.15	81.4 3.6	27.88 −.05	67.8 3.6	33.34 +.03	33.8 0.6
Oct. 6.4	11.08 −.02	68.9 0.3	50.92 .28	85.0 3.5	27.77 .16	71.4 3.5	33.36 .00	34.3 0.4
16.4	11.05 .05	69.1 +0.1	50.57 .41	88.4 3.3	27.55 .27	74.8 3.3	33.34 −.03	34.6 +0.2
26.4	10.99 −.07	69.1 −0.1	50.09 −.54	91.6 +2.9	27.23 −.37	77.9 +3.0	33.29 −.06	34.7 0.0
Nov. 5.4	10.90 .09	68.9 0.3	49.49 .65	94.3 2.6	26.81 .46	80.7 2.6	33.23 .08	34.6 −0.2
15.3	10.80 .10	68.5 0.4	48.79 .74	96.9 2.1	26.31 .54	83.1 2.2	33.14 .09	34.3 0.3
25.3	10.70 .11	68.1 0.6	48.00 .82	98.5 1.6	25.72 .61	85.1 1.7	33.04 .10	33.9 0.5
Dec. 5.3	10.58 .12	67.4 0.7	47.15 .86	99.8 1.0	25.08 .66	86.5 1.1	32.93 .11	33.3 0.6
15.3	10.46 −.12	66.7 −0.8	46.25 −.91	100.5 +0.4	24.40 −.70	87.3 +0.5	32.81 −.12	32.7 −0.7
25.2	10.35 .11	65.9 0.8	45.34 .91	100.6 −0.2	23.69 .71	87.5 −0.1	32.70 .12	31.9 0.8
35.2	10.24 −.10	65.1 −0.9	44.44 −.88	100.1 −0.6	22.98 −.70	87.1 −0.7	32.58 −.11	31.1 −0.8

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Cassiop.	22 Androm.	σ Androm.	ι Ceti.	6 Urs. Min., S. P.	44 Piscium.	π Androm.	ο Cassiop.
	31° 28′	44° 33′	53° 50′	99° 27′	358° 20′	88° 41′	56° 54′	42° 20′
	h m 0 3	h m 0 4	h m 0 12	h m 0 13	h m 0 13	h m 0 19	h m 0 30	h m 0 38
	s	s	s	s	s	s	s	s
(Dec. 30.2)	9.16 − .34	26.79 − .23	25.27 − .17	39.33 − .12	64.23 +7.84	36.00 − .12	50.60 − .20	25.92 − .25
Jan. 9.2	8.83 .32	26.57 .21	25.10 .17	39.22 .11	71.92 7.54	35.88 .11	50.41 .18	25.67 .24
19.2	8.52 .30	26.37 .20	24.94 .16	39.11 .10	79.31 7.21	35.78 .10	50.25 .16	25.43 .23
29.1	8.23 − .28	26.18 − .19	24.78 − .16	39.02 − .09	86.34 +6.85	35.68 − .09	50.09 − .15	25.21 − .22
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Aug. 26.6	13.32 + .22	30.33 + .20	28.57 + .18	42.43 + .15	28.49 −3.11	39.01 + .16	53.66 + .20	29.20 + .24
Sept. 5.5	13.51 .16	30.50 .14	28.73 .14	42.57 .13	25.88 2.11	39.16 .13	53.84 .16	29.42 .20
15.5	13.64 .10	30.61 .09	28.85 .10	42.69 .10	24.26 1.10	39.28 .10	53.98 .12	29.59 .14
25.5	13.70 + .04	30.68 + .04	28.92 .05	42.76 .06	23.69 −0.02	39.35 .06	54.07 .07	29.70 .09
Oct. 5.5	13.71 − .02	30.70 .00	28.95 + .01	42.81 + .02	24.21 +1.07	39.40 .03	54.13 + .03	29.77 + .05
15.4	13.66 − .07	30.67 − .04	28.95 − .02	42.80 − .02	25.84 +2.18	39.41 .00	54.15 .00	29.80 .00
25.4	13.56 .14	30.61 .08	28.91 .06	42.77 .04	28.57 3.26	39.39 − .03	54.13 − .03	29.78 − .04
Nov. 4.4	13.39 .19	30.51 .12	28.84 .09	42.73 .06	32.37 4.31	39.35 .05	54.09 .06	29.72 .08
14.4	13.19 .23	30.37 .15	28.74 .12	42.65 .08	37.20 5.29	39.28 .07	54.01 .09	29.62 .12
24.3	12.93 .26	30.21 .17	28.61 .14	42.55 .10	42.95 6.14	39.20 .09	53.91 .11	29.49 .15
Dec. 4.3	12.67 − .29	30.03 − .19	28.47 − .15	42.45 − .11	49.47 +6.84	39.10 − .10	53.79 − .13	29.32 − .17
14.3	12.36 .32	29.83 .21	28.31 .16	42.34 .12	56.63 7.36	38.99 .11	53.65 .14	29.14 .20
24.2	12.03 .33	29.61 .22	28.14 .17	42.22 .12	64.19 7.64	38.88 .11	53.50 .15	28.92 .22
34.2	11.71 − .32	29.39 − .22	27.97 − .17	42.11 − .11	71.91 +7.68	38.76 − .12	53.34 − .16	28.70 − .23

Mean Solar Date.	δ Piscium.	γ Cassiop.	μ Androm.	43 Cephei.	κ Tucanæ.	f Piscium.	κ Octantis, S. P.	υ Androm.
	83° 2′	29° 54′	52° 7′	4° 21′	159° 29′	86° 59′	184° 48′	49° 10′
	h m 0 42	h m 0 49	h m 0 50	h m 0 53	h m 1 11	h m 1 11	h m 1 22	h m 1 30
	s	s	s	s	s	s	s	s
(Dec. 30.2)	48.77 − .12	54.13 − .35	28.94 − .18	34.37 −2.85	55.07 − .56	57.93 − .12	50.11 +2.83	10.33 − .17
Jan. 9.2	48.65 .13	53.78 .35	28.76 .18	31.52 2.84	54.52 .54	57.81 .13	52.94 2.89	10.15 .19
19.2	48.52 .13	53.42 .34	28.58 .19	28.68 2.81	53.99 .53	57.68 .13	55.76 2.76	9.95 .22
29.1	48.40 − .12	53.09 − .34	28.38 − .20	25.90 −2.75	53.47 − .52	57.55 − .13	58.46 +2.71	9.71 − .26
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Sept. 5.6	51.75 + .14	58.08 + .24	32.13 + .20	49.55 +1.48	58.86 + .38	60.64 + .22	45.48 −1.65	13.21 + .24
15.6	51.88 .11	58.30 .20	32.30 .14	50.83 1.08	59.20 .30	60.82 .15	44.08 1.16	13.43 .20
25.5	51.98 .08	58.48 .14	32.41 .10	51.70 .67	59.47 .22	60.94 .11	43.10 .72	13.61 .16
Oct. 5.5	52.04 .05	58.57 .07	32.50 .06	52.16 + .25	59.64 .13	61.04 .08	42.58 − .28	13.75 .12
15.5	52.08 + .02	58.62 + .02	32.54 + .02	52.19 − .19	59.73 + .05	61.10 .05	42.54 + .22	13.85 .08
25.5	52.09 − .01	58.61 − .05	32.55 − 01	51.78 − .63	59.73 − .05	61.13 + .02	43.02 + .71	13.91 + .05
Nov. 4.4	52 06 .03	58.52 .11	32.52 .04	50.93 1.07	59.62 .15	61.14 − .01	43.97 1.21	13.94 + .01
14.4	52.03 .05	58.39 .17	32.46 .07	49.64 1.48	59.43 .24	61.11 .04	45.44 1.67	13.92 − .04
24.4	51.96 .07	58.19 .21	32.37 .10	47.98 1.85	59.14 .33	61.06 .06	47.30 2.06	13.87 .07
Dec. 4.3	51.87 .09	57.96 .25	32.25 .13	45.94 2.21	58.77 .40	60.99 .08	49.55 2.38	13.78 .10
14.3	51.78 − .11	57.69 − .29	32.11 − .15	43.57 −2.50	58.33 − .48	60.91 − .09	52.06 +2.61	13.67 − .13
24.3	51.66 .12	57.37 .32	31.95 .16	40.95 2.70	57.81 .54	60.81 .10	54.76 2.75	13.51 .16
34.3	51.54 − .13	57.04 − .32	31.78 − 17	38.17 −2.84	57.26 − .58	60.70 − .11	57.56 +2.81	13.34 .18

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	π Piscium. 78° 26′ h m 1 31	ν Piscium. 85° 5′ h m 1 35	ζ Ceti. 100° 54′ h m 1 45	γ Androm. 48° 13′ h m 1 56	β Trianguli. 55° 33′ h m 2 2	4 Urs. Min., S. P. 348° 5′ h m 2 9	γ Trianguli. 56° 41′ h m 2 10	67 Ceti. 96° 57′ h m 2 11
	s	s	s	s	s	s	s	s
(Dec. 30.3)	6.42 - .13	32.95 - .12	52.80 - .13	58.37 - .18	49.65 - .14	13.08 +1.05	36.25 - .13	20.80 - .09
Jan. 9.3	6.29 .13	32.83 .12	52.67 .13	58.19 .19	49.50 .16	14.15 1.09	36.11 .15	20.69 .12
12.9	6.16 .13	32.70 .13	52.55 .14	58.00 .20	49.33 .18	15.27 1.14	35.94 .17	20.56 .14
29.2	6.02 .14	32.56 .14	52.40 .15	57.79 .21	49.15 .19	16.43 1.14	35.76 .18	20.41 .15
Feb. 8.2	5.89 .14	32.43 .12	52.25 .15	57.57 .21	48.96 .19	17.55 1.10	35.58 .19	20.26 .15
18.2	5.75 - .14	32.32 - .11	52.11 - .14	57.37 - .20	48.78 - .18	18.63 +1.06	35.39 - .19	20.12 - .14
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Sept. 25.6	9.32 + .14	35.79 + .11	55.49 + .14	61.49 + .20	52.60 + .18	10.92 - .56	39.11 + .19	23.32 + .17
Oct. 5.5	9.44 .10	35.90 .10	55.62 .11	61.67 .16	52.77 .15	10.44 .40	39.29 .17	23.47 .13
15.5	9.52 .07	36.00 .08	55.71 .08	61.81 .12	52.91 .12	10.11 .25	39.44 .13	23.58 .10
25.5	9.57 + .04	36.05 + .05	55.79 + .05	61.90 + .07	53.01 + .09	9.94 - .08	39.55 + .09	23.68 + .08
Nov. 4.5	9.59 + .01	36.09 + .02	55.82 + .02	61.96 + .04	53.08 .05	9.95 + .10	39.62 .06	23.74 .05
14.4	9.59 - .02	36.09 - .01	55.83 - .01	61.98 .00	53.11 + .01	10.14 .29	39.67 + .03	23.77 + .02
24.4	9.55 .04	36.07 .04	55.80 .04	61.97 - .04	53.10 - .02	10.54 .48	39.67 - .01	23.77 - .01
Dec. 4.4	9.50 .06	36.01 .07	55.76 .06	61.91 .08	53.06 .05	11.10 .65	39.64 .04	23.75 .04
14.3	9.43 - .08	35.94 - .08	55.69 - .08	61.82 - .11	52.99 - .08	11.83 + .80	39.58 - .08	23.69 - .07
24.3	9.34 .10	35.86 .11	55.60 .11	61.69 .15	52.89 .12	12.70 .94	39.48 .12	23.61 .09
34.4	9.23 - .12	35.73 - .14	55.48 - .14	61.52 - .19	52.75 - .15	13.72 +1 08	39.35 - .15	23.51 - .11

Mean Solar Date.	δ Hydri. 159° 10′ h m 2 19	δ Ceti. 90° 10′ h m 2 33	μ Hydri. 169° 36′ h m 2 34	θ Persei. 41° 15′ h m 2 36	σ Arietis. 75° 23′ h m 2 45	47 Cephei. 11° 2′ h m 2 51	ε Arietis. 69° 7′ h m 2 52	β Persei. (*Algol.*) 49° 29′ h m 3 0
	s	s	s	s	s	s	s	s
(Dec. 30.3)	44.72 - .54	41.62 - .11	6.31 -1.10	29.96 - .16	15.58 - .09	10.60 - .77	45.49 - .09	49.81 - .11
Jan. 9.3	44.18 .55	41.51 .12	5.17 1.17	29.78 .20	15.48 .11	9.78 .87	45.39 .12	49.68 .15
19.3	43.62 .56	41.39 .13	3.96 1.22	29.55 .23	15.35 .13	8.85 .98	45.26 .14	49.51 .18
29.2	43.04 .57	41.25 .14	2.73 1.23	29.31 .25	15.21 .15	7.81 1.05	45.11 .15	49.31 .20
Feb. 8.2	42.48 .56	41.10 .15	1.51 1.21	29.06 .26	15.05 .16	6.75 1.07	44.95 .16	49.10 .21
18.2	41.92 - .55	40.94 - .16	0.31 -1.19	28.79 - .27	14.89 - .16	5.67 -1.09	44.78 - .17	48.88 - .22
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Sept. 25.6	47.07 + .37	43.97 + .20	8.08 + .74	32.96 + .28	17.96 + .20	16.09 + .87	47.88 + .21	52.42 + .26
Oct. 5.6	47.39 .27	44.15 .16	8.72 .54	33.22 .24	18.15 .18	16.91 .76	48.08 .19	52.67 .23
15.5	47.61 .17	44.29 .12	9.16 .33	33.44 .19	18.31 .15	17.61 .62	48.26 .17	52.89 .20
25.5	47.73 + .06	44.40 + .09	9.38 + .11	33.60 + .14	18.45 + .12	18.15 + .46	48.41 + .13	53.07 + .17
Nov. 4.5	47.73 - .05	44.48 .07	9.37 - .11	33.73 .10	18.55 .09	18.53 .28	48.52 .10	53.22 .13
14.5	47.63 .15	44.54 .04	9.14 .34	33.80 + .05	18.64 .06	18.70 + .09	48.61 .07	53.32 .09
24.4	47.42 .25	44.57 + .01	8.69 .55	33.84 .00	18.68 + .02	18.72 - .08	48.66 + .04	53.40 + .05
Dec. 4.4	47.13 .34	44.56 - .02	8.05 .73	33.81 - .05	18.68 - .01	18.54 .28	48.68 .00	53.42 .00
14.4	46.75 - .42	44.52 - .05	7.24 - .90	33.75 - .09	18.66 - .04	18.16 - .48	48.66 - .04	53.40 - .04
24.4	46.29 .48	44.47 .07	6.26 1.03	33.63 .13	18.61 .07	17.59 .05	48.61 .07	53.34 .09
34.3	45.79 - .52	44.38 - .10	5.18 -1.12	33.48 - .17	18.52 - .10	16.87 - .79	48.53 - .10	53.22 - .15

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Mean Solar Date.	ρ Octantis, S. P. 185° 55′ 3h 17m	ι Hydri. 167° 48′ 3h 18m	f Tauri. 77° 27′ 3h 24m	γ Camelop. 19° 1′ 3h 38m	γ Hydri. 164° 35′ 3h 48m	ε Persei. 50° 19′ 3h 50m	A¹ Tauri. 68° 14′ 3h 58m	c Persei. 42° 35′ 4h 0m
	s	s	s	s	s	s	s	s
(Dec. 30.3)	14.82 +2.11	50.19 − .85	38.53 − .06	29.36 − .30	62.71 − .60	17.19 − .09	1.59 − .04	28.73 − .06
Jan. 9.3	17.00 2.25	49.29 .94	38.45 .10	29.01 .40	62.07 .68	17.09 .12	1.53 .08	28.63 .12
19.3	19.32 2.37	48.30 1.02	38.34 .13	28.57 .48	61.34 .77	16.96 .15	1.43 .12	28.48 .17
29.3	21.75 2.43	47.24 1.06	38.20 .15	28.06 .54	60.53 .83	16.79 .18	1.30 .15	28.28 .21
Feb. 8.3	24.18 2.44	46.17 1.08	38.05 .16	27.49 .58	59.68 .87	16.59 .21	1.14 .17	28.05 .24
18.3	26.62 +2.39	45.09 −1.07	37.88 − .17	26.89 − .60	58.79 − .89	16.37 − .23	0.97 − .18	27.80 − .26
28.2	28.95 +2.27	44.03 −1.04	37.71 − .17	26.28 − .61	57.89 − .90	16.14 − .24	0.78 − .19	27.53 − .28
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Oct. 5.6	21.21 −1.13	50.30 + .66	40.80 + .22	33.17 + .60	61.92 + .62	19.65 + .30	3.74 + .25	31.26 + .32
15.6	20.23 .81	50.87 .47	41.00 .18	33.73 .53	62.47 .49	19.93 .26	3.98 .22	31.57 .30
25.5	19.60 − .42	51.25 + .29	41.16 + .15	34.22 + .44	62.89 + .36	20.17 + .22	4.19 + .19	31.86 + .27
Nov. 4.5	19.40 + .02	51.45 + .10	41.30 .13	34.61 .34	63.18 .22	20.38 .19	4.37 .17	32.10 .23
14.5	19.64 .44	51.45 − .09	41.42 .10	34.91 .24	63.32 + .07	20.55 .15	4.53 .14	32.31 .19
24.5	20.29 .85	51.27 .27	41.50 .06	35.10 .13	63.31 − .08	20.69 .11	4.65 .10	32.47 .14
Dec. 4.4	21.35 1.26	50.90 .46	41.54 + .03	35.17 + .01	63.16 .22	20.78 .07	4.73 .07	32.58 .09
14.4	22.80 +1.60	50.36 − .62	41.56 .00	35.13 − .10	62.86 − .38	20.82 + .02	4.79 + .03	32.64 + .03
24.4	24.55 1.89	49.66 .77	41.54 − .03	34.97 .22	62.40 .51	20.81 − .04	4.80 − .01	32.63 − .03
34.4	26.58 +2.14	48.83 − .88	41.49 − .06	34.69 − .34	61.85 − .61	20.75 − .09	4.77 − .05	32.58 − .08

Mean Solar Date.	o¹ Eridani. 97° 8′ 4h 6m	η Urs. Min., S. P. 346° 1′ 4h 20m	m Persei. 47° 11′ 4h 25m	δ Mensæ. 170° 29′ 4h 25m	τ Tauri. 67° 16′ 4h 35m	i Tauri. 71° 21′ 4h 44m	ζ Aurigæ. 49° 5′ 4h 54m	β Eridani. 95° 14′ 5h 2m
	s	s	s	s	s	s	s	s
(Dec. 30.4)	21.54 − .04	43.57 + .44	29.01 − .04	44.63 − .89	28.54 − .01	46.59 .00	35.87 − .01	18.43 .00
Jan. 9.4	21.48 .08	44.11 .62	28.95 .08	43.66 1.05	28.51 .05	46.57 − .04	35.84 .05	18.41 − .04
19.4	21.39 .11	44.81 .76	28.84 .13	42.52 1.21	28.44 .09	46.51 .08	35.77 .10	18.35 .08
29.3	21.27 .14	45.63 .85	28.68 .18	41.24 1.33	28.32 .13	46.41 .12	35.64 .15	18.25 .11
Feb. 8.3	21.11 .16	46.51 .92	28.48 .22	39.86 1.40	28.18 .16	46.27 .15	35.47 .19	18.12 .14
18.3	20.94 − .17	47.46 + .96	28.25 − .23	38.42 −1.44	28.01 − .18	46.11 − .17	35.26 − .22	17.96 − .17
28.3	20.77 .18	48.43 .96	28.01 .24	36.95 1.46	27.82 .19	45.93 .18	35.03 .24	17.78 .18
Mar. 10.2	20.59 − .17	49.37 + .92	27.77 − .25	35.50 −1.43	27.63 − .19	45.74 − .19	34.79 − .25	17.60 − .19
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Oct. 15.6	23.50 + .20	43.29 − .74	31.57 + .30	40.84 + .91	30.70 + .27	48.63 + .25	38.18 + .32	20.02 + .22
25.6	23.69 + .18	42.62 − .60	31.86 + .28	41.65 + .71	30.95 + .23	48.87 + .23	38.49 + .30	20.26 + .22
Nov. 4.6	23.87 .16	42.09 .46	32.13 .25	42.26 .49	31.17 .20	49.10 .21	38.78 .27	20.47 .21
14.5	24.01 .12	41.71 .31	32.35 .21	42.63 + .25	31.36 .17	49.30 .18	39.04 .24	20.65 .18
24.5	24.12 .09	41.48 − .14	32.54 .16	42.76 .00	31.52 .14	49.46 .15	39.26 .20	20.82 .15
Dec. 4.5	24.20 .05	41.43 + .04	32.68 .11	42.63 − .25	31.65 .11	49.59 .12	39.43 .15	20.96 .11
14.5	24.23 + .02	41.55 + .21	32.76 + .06	42.25 − .50	31.74 + .07	49.70 + .08	39.56 + .10	21.05 + .07
24.4	24.24 − .02	41.85 .39	32.79 + .01	41.63 .73	31.78 + .02	49.75 + .03	39.63 + .04	21.10 + .04
34.4	24.20 − .06	42.33 + .54	32.77 − .04	40.79 − .94	31.78 − .02	49.76 − .01	39.65 − .02	21.12 − .01

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Mean Solar Date.	τ Orionis.	χ Aurigæ.	Groombr. 944.	κ Orionis.	ν Aurigæ.	δ Doradus.	β Aurigæ.	θ Aurigæ.
	96° 58′	57° 54′	4° 52′	99° 43′	50° 53′	155° 47′	45° 4′	52° 48′
	h m 5 12	h m 5 25	h m 5 25	h m 5 42	h m 5 43	h m 5 44	h m 5 51	h m 5 52
	s	s	s	s	s	s	s	s
(Dec. 30.5)	7.96 + .01	23.40 + .04	65.65 − .24	24.67 + .06	40.51 + .07	37.57 − .14	15.59 + .08	2.00 + .07
Jan. 9.4	7.95 − .03	23.42 .00	65.16 .74	24.70 .00	40.55 + .01	37.39 .22	15.64 + .01	2.04 + .02
19.4	7.90 .07	23.39 − .05	64.18 1.22	24.66 − .05	40.53 − .05	37.12 .31	15.62 − .06	2.03 − .04
29.4	7.82 .11	23.31 .10	62.73 1.64	24.59 .10	40.45 .10	36.76 .40	15.53 .11	1.96 .09
Feb. 8.3	7.68 .14	23.18 .15	60.90 1.99	24.47 .13	40.33 .14	36.33 .47	15.40 .16	1.85 .14
18.3	7.53 − .17	23.01 − .18	58.73 −2.25	24.33 − .16	40.16 − .19	35.83 − .52	15.21 − .21	1.69 − .18
28.3	7.35 .19	22.82 .20	56.40 2.41	24.16 .18	39.95 .22	35.30 .55	14.99 .24	1.49 .21
Mar. 10.3	7.16 .18	22.61 .22	53.93 2.48	23.97 .19	39.72 .23	34.73 .57	14.73 .26	1.27 .22
20.3	6.98 − .18	22.38 − .24	51.44 −2.48	23.78 − .19	39.48 − .24	34.16 − .58	14.47 − .27	1.05 − .23
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Oct. 25.6	9.69 + .23	25.67 + .29	73.75 +2.58	26.18 + .26	42.78 + .34	36.39 + .48	17.92 + .37	4.19 + .33
Nov. 4.6	9.91 .21	25.95 .27	76.15 2.23	26.43 .23	43.11 .31	36.83 .40	18.28 .34	4.51 .31
14.6	10.12 .19	26.21 .24	78.21 1.90	26.65 .21	43.41 .28	37.20 .33	18.61 .31	4.81 .29
24.5	10.29 .16	26.44 .21	79.95 1.52	26.85 .18	43.68 .25	37.48 .24	18.91 .28	5.08 .26
Dec. 4.5	10.43 .12	26.64 .17	81.24 1.07	27.02 .15	43.91 .21	37.67 .14	19.17 .23	5.32 .22
14.5	10.53 + .08	26.79 + .12	82.09 + .59	27.15 + .11	44.09 + .16	37.76 + .04	19.38 + .18	5.51 + .17
24.5	10.59 .04	26.89 .08	82.42 + .08	27.24 .07	44.22 .11	37.75 − .06	19.53 .12	5.65 .12
34.4	10.62 + .01	26.96 + .04	82.26 − .44	27.28 + .04	44.30 + .06	37.63 − .16	19.62 + .06	5.74 + .07

Mean Solar Date.	η Geminor.	ψ¹ Aurigæ.	ν Geminor.	χ Draconis, S. P.	ε Geminor.	ψ⁵ Aurigæ.	θ Geminor.	ζ Mensæ.
	67° 28′	40° 39′	69° 43′	342° 41′	64° 45′	46° 19′	55° 54′	170° 42′
	h m 6 8	h m 6 16	h m 6 22	h m 6 23	h m 6 36	h m 6 38	h m 6 45	h m 6 49
	s	s	s	s	s	s	s	s
(Dec. 30.5)	4.29 + .09	13.01 + .13	16.05 + .09	1.38 + .02	59.62 + .11	36.67 + .14	21.40 + .13	36.14 − .14
Jan. 9.5	4.35 + .03	13.10 + .05	16.12 + .04	1.47 .16	59.71 .06	36.78 .08	21.51 .08	35.88 .38
19.4	4.36 − .02	13.11 − .02	16.14 .00	1.69 .30	59.75 + .01	36.82 + .01	21.57 + .03	35.37 .63
29.4	4.31 .07	13.05 .09	16.11 − .05	2.07 .43	59.74 − .04	36.80 − .05	21.56 − .03	34.62 .86
Feb. 8.4	4.22 .11	12.93 .15	16.04 .10	2.55 .53	59.67 .09	36.72 .11	21.50 .08	33.66 1.06
18.4	4.10 − .14	12.75 − .20	15.92 − .14	3.12 + .62	59.56 − .13	36.58 − .16	21.39 − .13	32.51 −1.22
28.3	3 94 .17	12.52 .25	15.77 .17	3.80 .70	59.42 .16	36.39 .20	21.23 .17	31.22 1.35
Mar. 10.3	3.76 .19	12.25 .28	15.59 .18	4.54 .75	59.24 .19	36.18 .23	21.04 .20	29.81 1.44
20.3	3.56 .20	11.97 .29	15.40 .19	5.29 .77	59.05 .20	35.94 .25	20.83 .22	28.33 1.50
30.2	3.37 .19	11.68 .28	15.21 .18	6.07 .77	58.85 .19	35.68 .26	20.62 .23	26.81 1.53
Apr. 9.2	3.18 − .19	11.40 − .27	15.03 − .17	6.83 + .76	58.67 − .18	35.42 − .26	20.38 − .24	25.28 −1.54
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Nov. 14.6	6.72 + .27	16.03 + .37	18.37 + .28	1.72 − .59	61.98 + .30	39.39 + .36	23.88 + .33	29.38 +1.00
24.6	6.97 .23	16.38 .33	18.63 .24	1.20 .46	62.26 .27	39.73 .32	24.19 .30	30.27 .78
Dec. 4.6	7.19 .20	16.69 .28	18.86 .21	0.80 .33	62.51 .24	40.04 28	24.47 .26	30.93 .55
14.5	7.37 + .16	16.94 + .22	19.05 + .18	0.53 − .21	62.73 + .20	40.30 + .24	24.71 + .22	31.37 + .31
24.5	7.52 .12	17.14 .16	19.21 .13	0.38 − .07	62.90 .16	40.52 .19	24.91 .18	31.54 + .03
34.5	7.61 + .07	17.27 + .11	19.32 + .08	0.39 + .06	63.04 + .12	40.68 + .14	25.07 + .14	31.43 − .25

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Mean Solar Date.	ζ Geminor.	63 Aurigæ.	25 Camelop.	γ² Volantis.	β Can. Min.	26 Lyncis.	Groombr. 1374.	ω¹ Cancri.
	69° 16′	50° 30′	7° 22′	160° 19′	81° 29′	42° 9′	15° 47′	64° 18′
	h m 6 57	h m 7 3	h m 7 7	h m 7 9	h m 7 21	h m 7 46	h m 7 46	h m 7 54
	s	s	s	s	s	s	s	s
(Dec. 30.5)	25.24 + .13	53.89 + .17	22.82 + .68	46.92 + .05	2.15 + .14	29.85 + .24	41.77 + .52	6.33 + .19
Jan. 9.5	25.35 .08	54.03 .11	23.32 + .31	46.91 − .07	2.27 .10	30.06 .18	42.19 .32	6.50 .15
19.5	25.41 + .03	54.11 + .05	23.44 − .04	46.78 .19	2.35 + .05	30.20 .11	42.41 + .15	6.63 .10
29.4	25.41 − .02	54.12 − .02	23.24 .38	46.53 .31	2.37 .00	30.28 + .04	42.49 − .01	6.69 + .03
Feb. 8.4	25.37 .06	54.07 .07	22.68 .71	46.16 .41	2.34 − .05	30.27 − .04	42.39 .18	6.70 − .02
18.4	25.28 − .11	53.97 − .13	21.82 − .99	45.70 − .50	2.27 − .09	30.20 − .11	42.13 − .33	6.65 − .07
28.4	25.14 .14	53.81 .18	20.70 1.23	45.15 .58	2.16 .13	30.06 .17	41.73 .46	6.57 .10
Mar. 10.3	24.99 .17	53.62 .21	19.36 1.42	44.53 .64	2.02 .15	29.87 .21	41.21 .57	6.44 .15
20.3	24.81 .19	53.39 .22	17.88 1.53	43.86 .68	1.86 .17	29.65 .24	40.59 .65	6.27 .17
30.3	24.62 .19	53.16 .23	16.31 1.57	43.17 .69	1.68 .18	29.40 .26	39.91 .70	6.09 .18
Apr. 9.2	24.43 − .18	52.93 − .22	14.71 −1.57	42.48 − .68	1.50 − .17	29.13 − .27	39.19 − .72	5.91 − .18
19.2	24.25 − .17	52.72 − .19	13.16 −1.51	41.81 − .64	1.34 − .15	28.86 − .27	38.48 − .71	5.74 − .17
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Nov. 24.6	27.72 + .28	56.74 + .33	30.57 +1.63	45.35 + .49	4.33 + .26	32.68 + .42	45.85 + .90	8.68 + .32
Dec. 4.6	27.98 .24	57.05 .30	32.10 1.42	45.78 .37	4.58 .24	33.08 .37	46.70 .80	8.99 .29
14.6	28.20 + .20	57.33 + .26	33.41 +1.16	46.09 + .26	4.82 + .22	33.43 + .33	47.46 + .70	9.27 + .26
24.5	28.39 .17	57.56 .21	34.42 .85	46.30 .14	5.02 .18	33.74 .29	48.10 .58	9.52 .23
34.5	28.54 + .14	57.74 + .16	35.12 + .58	46.37 + .02	5.18 + .14	34.01 + .25	48.62 + .47	9.74 + .20

Mean Solar Date.	ζ¹ Cancri.	β Cancri.	30 Monocerotis.	θ Chamæleontis.	σ Hydræ.	γ Cancri.	σ³ Cancri. (*mean.*)	θ Hydræ.
	72° 1′	80° 28′	93° 32′	167° 7′	86° 16′	68° 8′	59° 0′	87° 13′
	h m 8 5	h m 8 10	h m 8 20	h m 8 24	h m 8 32	h m 8 36	h m 8 47	h m 9 8
	s	s	s	s	s	s	s	s
(Dec. 30.6)	44.51 + .19	23.87 + .19	1.57 + .19	7.92 + .33	51.80 + .20	45.33 + .23	21.46 + .25	29.66 + .24
Jan. 9.5	44.68 .15	24.04 .15	1.74 .14	8.17 + .17	51.98 .16	45.54 .18	21.69 .21	29.88 .20
19.5	44.81 .10	24.17 .11	1.86 .09	8.25 − .01	52.13 .12	45.70 .13	21.88 .16	30.05 .15
29.5	44.89 + .05	24.24 + ,05	1.93 + .04	8.14 .20	52.22 .07	45.81 .08	22.00 .10	30.17 .10
Feb. 8.5	44.91 .00	24.26 .00	1.95 .00	7.85 .37	52.26 + .02	45.86 + .03	22.07 + .05	30.25 .06
18.4	44.89 − .05	24.24 − .05	1.94 − .04	7.40 − .53	52.26 − .03	45 87 − .02	22.10 − .01	30.29 + .01
28.4	44.81 .10	24.17 .09	1.87 .08	6.78 .68	52.20 .07	45.82 .07	22.05 .06	30.26 − .04
Mar. 10.4	44.69 .13	24.06 .12	1.76 .12	6.03 .79	52.11 .11	45.73 .11	21.96 .11	30.20 .08
20.4	44.55 .15	23.92 .15	1.63 .15	5.19 .88	51.99 .14	45.60 .14	21.83 .14	30.10 .11
30.3	44.38 .17	23.76 .16	1.47 .16	4.26 .95	51.84 .15	45.45 .16	21.67 .16	29.98 .13
Apr. 9.3	44.21 − .18	23.60 − .17	1.31 − .17	3.28 − .99	51.68 − .16	45.29 − .17	21.51 − .17	29.85 − .14
19.3	44.03 .17	23.43 .17	1.14 .16	2.27 1.02	51.52 .16	45.12 .17	21.32 .18	29.70 .15
29.2	43.88 .15	23.26 .15	0.98 .15	1.24 1.02	51.36 .15	44.95 .16	21.14 .17	29.55 .15
May 9.2	43.73 − .13	23.13 − .12	0.84 − .13	0.24 − .98	51.22 − .14	44.80 − .14	20.98 − .16	29.41 − .14

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Argus.	α Lyncis.	10 Leonis Minoris.	ο Leonis.	ζ Chamæleontis.	19 Leonis Minoris.	π Leonis.	λ Ursæ Majoris.
	159° 15′	55° 8′	53° 6′	79° 36′	170° 26′	48° 24′	81° 25′	46° 31′
	9h 11m	9h 14m	9h 27m	9h 35m	9h 37m	9h 50m	9h 54m	10h 10m
	s	s	s	s	s	s	s	s
(Dec. 30.0)	61.36 + .40	10.50 + .29	18.29 + .31	7.53 + .26	19.82 + .85	45.88 + .34	14.79 + .27	16.78 + .36
Jan. 9.6	61.70 .28	10.77 .24	18.58 .27	7.77 .22	20.56 .63	46.20 .30	15.04 .23	17.13 .33
19.6	61.92 .16	10.99 .19	18.83 .22	7.98 .18	21.08 .40	46.48 .25	15.26 .19	17.44 .27
29.5	62.03 + .05	11.16 .13	19.01 .15	8.14 .13	21.36 + .16	46.70 .18	15.43 .15	17.68 .21
Feb. 8.5	62.01 − .07	11.26 .07	19.13 .09	8.25 .08	21.41 − .07	46.85 .12	15.56 .10	17.87 .16
18.5	61.89 − .18	11.31 + .02	19.19 + .03	8.30 + .03	21.21 − .30	46.95 + .06	15.64 + .05	17.99 + .09
28.5	61.65 .29	11.30 − .04	19.20 − .02	8.31 − .02	20.81 ..50	46.98 .00	15.67 .00	18.05 + .03
Mar. 10.4	61.31 .38	11.23 .09	19.15 .08	8.27 .06	20.20 .70	46.95 − .06	15.65 − .04	18.04 − .04
20.4	60.90 .44	11.12 .13	19.04 .12	8.19 .09	19.41 .87	46.86 .11	15.59 .07	17.97 .09
30.4	60.42 .50	10.97 .16	18.90 .15	8.09 .12	18.47 1.01	46.73 .14	15.50 .10	17.85 .13
Apr. 9.3	59.89 − .54	10.81 − .18	18.74 − .17	7.96 − .13	17.39 −1.13	46.58 − .17	15.40 − .12	17.71 − .16
19.3	59.34 .57	10.62 .19	18.56 .18	7.83 .14	16.22 1.21	46.39 .19	15.26 .13	17.53 .18
29.3	58.76 .58	10.43 .19	18.36 .19	7.68 .15	14.97 1.27	46.19 .20	15.13 .14	17.34 .20
May 9.3	58.17 .59	10.24 .18	18.18 .18	7.54 .14	13.69 1.30	45.99 .19	14.99 .13	17.13 .20
19.2	57.59 − .58	10.08 − .15	18.00 − .17	7.40 − .14	12.37 −1.33	45.80 − .18	14.86 − .12	16.94 − .18

Mean Solar Date.	μ Hydræ.	β Leonis Minoris.	α Antliæ.	β Octantis, S. P.	41 Leonis Minoris.	δ² Chamæleontis.	46 Leonis Minoris.	Groombr. 1706.
	106° 16′	52° 43′	120° 30′	188° 2′	66° 13′	169° 57′	55° 11′	11° 37′
	10h 20m	10h 21m	10h 21m	10h 34m	10h 37m	10h 44m	10h 46m	10h 50m
	s	s	s	s	s	s	s	s
Jan. 19.6	38.52 + .21	21.46 + .26	60.11 + .21	15.48 − .70	16.81 + .24	50.94 + .77	59.93 + .28	55.04 + .95
29.6	38.71 .17	21.70 .21	60.30 .17	14.91 .44	17.03 .20	51.61 .57	60.19 .23	55.90 .77
Feb. 8.6	38.86 .12	21.89 .15	60.45 .12	14.60 − .19	17.22 .16	52.07 .36	60.40 .18	56.59 .59
18.5	38.95 .07	22.01 .09	60.54 .06	14.53 + .04	17.35 .11	52.32 + .15	60.55 .12	57.07 .38
28.5	38.99 + .02	22.08 + .04	60.58 + .01	14.69 .27	17.43 .06	52.36 − .06	60.65 .07	57.34 + .17
Mar. 10.5	39.00 − .02	22.09 − .02	60.56 − .04	15.08 + .51	17.46 + .01	52.19 − .26	60.69 + .01	57.40 − .04
20.4	38.96 .06	22.05 .07	60.51 .07	15.72 .74	17.44 − .04	51.84 .44	60.68 − .04	57.25 .25
30.4	38.88 .09	21.96 .11	60.42 .10	16.56 .95	17.38 .08	51.30 .61	60.62 .08	56.90 .44
Apr. 9.4	38.78 .11	21.83 .13	60.30 .13	17.62 1.13	17.29 .10	50.61 .76	60.52 .11	56.37 .59
19.4	38.67 .12	21.69 .15	60.16 .15	18.83 1.30	17.18 .12	49.78 .88	60.41 .13	55.71 .71
29.3	38.54 − .13	21.52 − .17	60.01 − .16	20.22 +1.40	17.06 − .13	48.84 − .99	60.26 − .15	54.94 − .81
May 9.3	38.40 .14	21.34 .18	59.85 .16	21.71 1.54	16.91 .15	47.79 1.07	60.10 .16	54.08 .88
19.3	38.26 .14	21.17 .17	59.69 .17	23.31 1.63	16.77 .14	46.70 1.12	59.95 .16	53.17 .91
29.3	38.12 .14	21.00 .16	59.52 .16	24.97 1.66	16.64 .13	45.55 1.16	59.78 .16	52.26 .91
June 8.2	37.99 − .13	20.84 − .15	59.37 − .14	26.64 +1.68	16.51 − .13	44.37 −1.19	59.63 − .15	51.36 − .90

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Octantis.	p³ Leonis.	ψ Urs. Maj.	ν Urs. Maj.	ξ Hydræ.	χ Urs. Maj.	π Virginis.	ε Corvi.
	173° 59′	87° 26′	44° 53′	56° 17′	121° 14′	41° 36′	82° 45′	111° 59′
	h m	h m	h m	h m	h m	h m	h m	h m
	11 0	11 1	11 3	11 12	11 27	11 40	11 55	12 4
	s	s	s	s	s	s	s	s
Feb. 8.6	19.82 + .70	9.36 + .15	19.44 + .94	23.43 + .20	28.07 + .21	5.71 + .30	5.69 + .22	19.99 + .22
18.6	20.35 .36	9.49 .11	19.64 .17	23.61 .15	28.25 .15	5.97 .22	5.89 .18	20.19 .18
28.5	20.53 + .03	9.59 .07	19.77 .10	23.74 .10	28.37 .10	6.15 .15	6.04 .13	20.35 .14
Mar. 10.5	20.40 − .30	9.63 + .02	19.83 + .04	23.81 + .04	28.44 + .05	6.27 .09	6.14 .08	20.46 .09
20.5	19.92 .62	9.64 − .01	19.84 − .02	23.82 .00	28.46 . .00	6.32 + .03	6.20 .04	20.53 .04
30.4	19.16 − .90	9.60 − .04	19.78 − .07	23.80 − .04	28.45 − .03	6.32 − .03	6.23 + .01	20.56 + .01
Apr. 9.4	18.11 1.17	9.56 .06	19.68 .11	23.73 .08	28.40 .06	6.25 .08	6.22 − .02	20.56 − .01
19.4	16.82 1.40	9.48 .09	19.56 .14	23.64 .11	28.32 .09	6.15 .13	6.19 .05	20.53 .04
29.4	15.30 1.60	9.38 .10	19.39 .17	23.51 .13	28.22 .11	6.00 .16	6.12 .07	20.48 .07
May 9.3	13.61 1.76	9.27 .11	19.20 .19	23.37 .14	28.10 .13	5.83 .18	6.04 .08	20.40 .09
19.3	11.78 −1.88	9.15 − .12	19.01 − .20	23.22 − .15	27.96 − .14	5.63 − .20	5.95 − .09	20.30 − .10
29.3	9.85 1.96	9.04 .12	18.80 .21	23.07 .16	27.82 .15	5.43 .21	5.86 .10	20.20 .11
June 8.3	7.86 1.98	8.92 .11	18.60 .19	22.90 .15	27.66 .16	5.20 .22	5.74 .11	20.08 .12
18.2	5.88 −1.96	8.81 − .11	18.42 − .17	22.76 − .14	27.51 − .15	5.00 − .20	5.63 − .11	19.97 − .11

Mean Solar Date.	2 Can. Ven.	6 Urs. Min.	δ² Corvi.	β Can. Ven.	γ Virginis, (*mean.*)	31 Cor. Bor.	γ Cassiop., S. P.	43 Cephei, S. P.
	48° 43′	1° 40′	105° 53′	48° 1′	90° 50′	61° 51′	330° 6′	355° 39′
	h m	h m	h m	h m	h m	h m	h m	h m
	12 10	12 14	12 24	12 28	12 35	12 46	12 49	12 53
	s	s	s	s	s	s	s	s
Feb. 8.6	28.39 + .27	32.81 +5.78	2.08 + .23	23.07 + .31	56.78 + .24	12.19 + .26	52.78 − .32	23.23 −2.45
18.6	28.64 .23	37.99 4.58	2.29 .19	23.35 .25	57.00 .20	12.44 .23	52.49 .26	20.98 2.05
28.6	28.85 .17	41.97 3.34	2.46 .15	23.57 .19	57.17 .16	12.66 .19	52.27 .19	19.13 1.63
Mar. 10.5	28.99 .12	44.67 1.99	2.59 .11	23.73 .14	57.31 .12	12.83 .14	52.12 .13	17.73 1.16
20.5	29.08 .06	45.94 + .57	2.69 .07	23.85 .09	57.41 .09	12.95 .10	52.02 − .06	16.82 .64
30.5	29.12 + .01	45.83 − .79	2.74 + .03	23.91 + .03	57.48 + .05	13.03 + .06	52.01 + .03	16.46 − .08
Apr. 9.5	29.11 − .03	44.35 2.11	2.76 .00	23.91 − .02	57.52 + .02	13.07 + .01	52.09 .12	16.67 + .46
19.4	29.06 .07	41.60 3.33	2.75 − .02	23.88 .06	57.52 − .01	13.06 − .02	52.25 .20	17.38 .98
29.4	28.97 .10	37.68 4.41	2.72 .05	23.80 .09	57.49 .04	13.04 .04	52.48 .28	18.64 1.46
May 9.4	28.85 .13	32.78 5.31	2.66 .07	23.70 .12	57.45 .06	12.97 .07	52.81 .36	20.30 1.86
19.4	28.70 − .15	27.06 −6.02	2.58 − .08	23.56 − .14	57.38 − .07	12.89 − .09	53.19 + .41	22.36 +2.22
29.3	28.55 .17	20.74 6.51	2.49 .09	23.41 .16	57.30 .08	12.79 .11	53.62 .45	24.75 2.50
June 8.3	28.37 .18	14.03 6.81	2.39 .10	23.24 .17	57.21 .09	12.67 .12	54.09 .49	27.36 2.69
18.3	28.20 − .17	7.13 −6.90	2.29 − .10	23.06 − .18	57.11 − .10	12.55 − .12	54.61 + .53	30.14 +2.85

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Muscæ.	ε Virginis.	20 Can. Ven.	κ Octantis.	B.A.C. 4536.	m Virginis.	θ Apodis.	π Hydræ.
	160° 56′	78° 26′	48° 50′	175° 12′	52° 14′	98° 8′	166° 15′	116° 8′
	12h 54m	12h 56m	13h 12m	13h 22m	13h 29m	13h 35m	13h 54m	13h 59m
	s	s	s	s	s	s	s	s
Mar. 0.6	35.06 + .42	34.07 + .17	29.38 + .22	65.29 + 1.83	45.80 + .26	41.84 + .20	25.98 + .80	57.44 + .23
10.6	35.43 .32	34.23 .14	29.59 .19	66.94 1.49	46.04 .21	42.03 .17	26.72 .68	57.66 .21
20.6	35.70 .22	34.36 .10	29.77 .14	68.22 1.09	46.21 .16	42.19 .14	27.33 .55	57.87 .18
30.5	35.88 .13	34.44 .07	29.89 .09	69.12 .72	46.35 .11	42.32 .11	27.81 .42	58.03 .14
Apr. 9.5	35.95 + .03	34.50 .04	29.95 + .04	69.63 + .34	46.44 .06	42.42 .08	28.18 .29	58.16 .11
19.5	35.93 − .06	34.52 + .01	29.96 .00	69.77 − .06	46.48 + .02	42.48 + .04	28.39 + .16	58.26 + .08
29.4	35.82 .15	34.51 − .02	29.95 − .04	69.51 .45	46.48 − .01	42.51 + .02	28.48 + .03	58.33 .05
May 9.4	35.63 .23	34.48 .04	29.88 .08	68.87 .83	46.45 .05	42.52 − .01	28.44 − .10	58.36 + .02
19.4	35.35 .31	34.42 .06	29.79 .11	67.85 1.17	46.38 .08	42.50 .03	28.27 .23	58.37 .00
29.4	35.01 .37	34.35 .08	29.67 .13	66.52 1.47	46.29 .11	42.46 .05	27.98 .35	58.35 − .03
June 8.3	34 60 − .44	34.26 − .09	29.53 − .15	64.89 − 1.78	46.16 − .13	42.40 − .07	27.57 − .47	58.31 − .06
18.3	34.13 .49	34.16 .10	29.36 .17	62.96 2.02	46.03 .15	42.33 .09	27.04 .57	58.23 .08
28.3	33.61 .52	34.05 .11	29.19 .18	60.85 2.20	45.87 .16	42.23 .10	26.43 .65	58.14 .10
July 8.3	33.10 − .50	33.93 − .12	29.01 − .19	58.55 − 2.32	45.70 − .17	42.13 − .11	25.74 − .68	58.02 − .12

Mean Solar Date.	d Bootis.	κ Virginis.	δ Octantis.	4 Urs. Min.	λ Bootis.	λ Virginis.	α Apodis.	μ Hydri, S. P.
	64° 22′	99° 45′	173° 9′	11° 55′	43° 24′	102° 51′	168° 34′	190° 24′
	14h 5m	14h 6m	14h 9m	14h 9m	14h 12m	14h 13m	14h 33m	14h 34m
	s	s	s	s	s	s	s	s
Mar. 20.6	15.83 + .18	53.35 + .19	6.94 + 1.18	21.21 + .61	6.43 + .22	1.00 + .19	58.78 + .81	8.53 + .84
30.6	15.99 .14	53.52 .15	7.99 .93	21.73 .43	6.63 .17	1.17 .15	59.53 .69	9.29 .69
Apr. 9.5	16.11 .10	53.65 .11	8.80 .67	22.07 .25	6.78 .12	1.30 .12	60.15 .56	9.90 .52
19.5	16.19 .07	53.74 .08	9.32 .39	22.22 + .06	6.87 .07	1.41 .09	60.62 .40	10.32 .33
29.5	16.25 + .04	53.81 + .05	9.58 + .12	22.18 − .13	6.92 + .02	1.48 .06	60.93 .23	10.55 + .14
May 9.5	16.27 .00	53.84 + .02	9.55 − .16	21.96 − .30	6.92 − .03	1.53 + .03	61.07 + .07	10.59 − .06
19.4	16.26 − .03	53.86 .00	9.25 .42	21.57 .46	6.86 .07	1.54 .00	61.06 − .09	10.42 .26
29.4	16.21 .06	53.85 − .02	8.70 .68	21.03 .60	6.78 .10	1.54 − .02	60.88 .26	10.07 .45
June 8.4	16.15 .07	53.81 .05	7.89 .93	20.37 .72	6.66 .14	1.50 .05	60.53 .42	9.52 .63
18.3	16.06 .10	53.75 .07	6.84 1.15	19.59 .81	6.50 .17	1.45 .07	60.04 .55	8.81 .78
28.3	15.95 − .12	53.67 − .09	5.59 − 1.33	18.74 − .89	6.32 − .19	1.37 − .09	59.42 − .68	7.96 − .91
July 8.3	15.82 .13	53.57 .11	4.18 1.49	17.81 .94	6.12 .21	1.27 .11	58.67 .79	6.98 1.03
18.3	15.68 .14	53.45 .12	2.62 1.62	16.85 .97	5.89 .23	1.15 .12	57.83 .88	5.89 1.11
28.2	15.53 − .15	53.32 − .13	0.94 − 1.72	15.87 − .99	5.66 − .24	1.03 − .13	56.91 − .95	4.75 − 1.15

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	33 Bootis.	47 Cephei, S. P.	γ Scorpii.	δ Bootis.	ρ Octantis.	β Cor. Bor.	γ Camelop., S. P.	δ¹ Apodis.
	45° 6′	348° 58′	114° 50′	56° 16′	174° 5′	60° 30′	340° 59′	168° 24′
	h m 14 34	h m 14 51	h m 14 57	h m 15 10	h m 15 17	h m 15 23	h m 15 38	h m 16 3
	s	s	s	s	s	s	s	s
Mar. 30.6	39.19 + .21	2.25 − .55	28.95 + .20	57.97 + .22	35.13 +1.72	11.27 + .23	24.71 − .45	34.82 +1.06
Apr. 9.6	39.37 .15	1.80 .35	29.14 .18	58.17 .18	36.68 1.42	11.48 .19	24.33 .31	35.82 .94
19.5	39.49 .10	1.56 − .13	29.30 .15	58.32 .14	37.96 1.12	11.64 .15	24.10 .17	36.70 .81
29.5	39.56 .06	1.54 + .08	29.44 .12	58.44 .10	38.92 .81	11.78 .12	23.99 − .05	37.44 .67
May 9.5	39.60 + .02	1.73 .31	29.53 .08	58.52 .07	39.58 .51	11.87 .08	24.01 + .08	38.03 .52
19.5	39.59 − .03	2.16 + .52	29.60 + .05	58 57 + .03	39.92 + .17	11.94 + .04	24.15 + .21	38.47 + .35
29.4	39.53 .08	2.77 .69	29.64 + .02	58.57 − .01	39.91 − .17	11.96 .00	24.43 .33	38.73 + .18
June 8.4	39.43 .11	3.55 .85	29.64 − .01	58.55 .04	39.57 .50	11.94 − .03	24.81 .44	38.82 .00
18.4	39.31 .14	4.47 .99	29.61 .04	58.48 .08	38.90 .82	11.90 .06	25.30 .54	38.73 − .18
28.3	39.15 .17	5.54 1.11	29.56 .07	58.39 .11	37.93 1.12	11.82 .09	25.89 .62	38.46 .35
July 8.3	38.96 − .20	6.70 +1.19	29.47 − .10	58.26 − .14	36.66 −1.39	11.71 − .12	26.56 + .70	38.02 − .50
18.3	38.75 .22	7.92 1.24	29.36 .12	58.11 .16	35.15 1.62	11.58 .14	27.29 .74	37.44 .64
28.3	38.53 .23	9.18 1.27	29.23 .14	57.94 .18	33.41 1.80	11.42 .16	28.05 .77	36.73 .78
Aug. 7.2	38.28 .25	10.46 1.27	29.07 .16	57.75 .20	31.54 1.90	11.25 .18	28.84 .79	35.90 .87
17.2	38.04 .24	11.71 1.24	28.91 .17	57.54 .21	29.61 1.94	11.05 .20	29.63 .79	34.98 .94
27.2	37.81 − .23	12.93 +1.20	28.73 − .18	57.34 − .20	27.66 −1.95	10.86 − .19	30.41 + .78	34.02 − .99

Mean Solar Date.	φ Herculis.	σ Cor. Bor. (*mean.*)	γ Apodis.	η Urs. Min.	η Ophiuchi.	π Herculis.	θ Ophiuchi.	δ Aræ.
	44° 46′	55° 51′	168° 38′	13° 59′	105° 35′	53° 4′	114° 53′	150° 35′
	h m 16 5	h m 16 10	h m 16 16	h m 16 20	h m 17 3	h m 17 11	h m 17 15	h m 17 20
	s	s	s	s	s	s	s	s
Apr. 9.6	13.66 + .25	27.90 + .24	14.77 + .99	51.82 + .64	54.84 + .29	7.63 + .30	5.20 + .32	55.90 + .54
19.6	13.89 .21	28.12 .20	15.70 .88	52.40 .52	55.11 .25	7.91 .26	5.50 .28	56.41 .48
29.6	14.08 .17	28.29 .16	16.52 .74	52.85 .38	55.34 .22	8.15 .23	5.75 .24	56.86 .43
May 9.6	14.22 .13	28.44 .13	17.17 .58	53.15 .23	55.55 .20	8 36 .19	5.96 .22	57.28 .39
19.5	14.33 .08	28.55 .09	17.68 .42	53.30 + .07	55.73 .17	8.53 .16	6.19 .20	57.63 .33
29.5	14.38 + .03	28.62 + .05	18.01 + .24	53.29 − .08	55.89 + .14	8.67 + .11	6.37 + .16	57.94 + .27
June 8.5	14.38 − .02	28.64 + .01	18.16 + .06	53.13 .23	56.01 .11	8.75 .07	6.51 .13	58.16 .20
18.4	14.34 .06	28.64 − .03	18.12 − .12	52.82 .38	56.10 .07	8.81 + .03	6.62 .09	58.33 .13
28.4	14.25 .11	28.58 .07	17.91 .30	52.37 .51	56.15 + .03	8.81 − .02	6.68 .05	58.41 + .05
July 8.4	14.11 .15	28.50 .10	17.52 .47	51.80 .62	56.15 − .01	8.77 .06	6.71 + .01	58.42 − .03
18.4	13.94 − .18	28.37 − .14	16.97 − .62	51.12 − .72	56.13 − .04	8.69 − .10	6.69 − .04	58.35 − .10
28.3	13.74 .22	28.22 .16	16.27 .76	50.35 .81	56.07 .08	8.56 .14	6.64 .08	58.21 .18
Aug. 7.3	13.50 .24	28.04 .19	15.45 .87	49.50 .87	55.97 .11	8.39 .18	6.54 .12	57.99 .24
17.3	13.25 .26	27.83 .21	14.52 .95	48.60 .92	55.84 .14	8.19 .21	6.40 .15	57.72 .30
27.3	12.97 .28	27.61 .22	13.54 .99	47.66 .94	55.68 .16	7.97 .23	6.24 .17	57.38 .35
Sept. 6.2	12.69 − .27	27.38 − .23	12.53 −1.00	46.71 − .95	55.51 − .18	7.72 − .25	6.06 − .19	57.02 − .37
16.2	12.42 .26	27.16 .23	11.54 .96	45.77 .91	55.32 .19	7.48 .25	5.86 .20	56.64 .38
26.2	12.16 .24	26.93 .24	10.61 .88	44.90 .84	55.14 .17	7.22 .24	5.67 .19	56.26 .36
Oct. 6.1	11.94 − .20	26.69 − .24	9.77 − .78	44.09 − .74	54.99 − .14	6.99 − .22	5.49 − .18	55.91 − .34

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombr. 944,S.P.	ι Herculis.	θ Herculis.	o Herculis.	λ Sagittarii.	χ Draconis.	ζ Pavonis.	γ Lyræ.
	355° 8′	43° 56′	52° 44′	61° 15′	115° 29′	17° 19′	161° 31′	57° 28′
	h m 17 25	h m 17 36	h m 17 52	h m 18 3	h m 18 21	h m 18 23	h m 18 29	h m 18 54
	s	s	s	s	s	s	s	s
May 19.6	41.38 − .54	18.58 + .19	24.44 + .18	9.78 + .19	1.58 + .25	9.28 + .43	53.85 + .63	44.60 + .24
29.6	41.07 − .08	18.75 .15	24.61 .15	9.96 .17	1.82 .23	9.65 .31	54.44 .55	44.83 .22
June 8.5	41.23 + .39	18.87 .09	24.75 .12	10.12 .13	2.03 .19	9.90 .19	54.96 .46	45.04 .18
18.5	41.85 .84	18.93 + .04	24.84 07	10.22 .09	2.20 .15	10.03 + .07	55.35 .35	45.20 .14
28.5	42.92 1.27	18.95 − .01	24.89 + .03	10.29 + .05	2.33 .11	10.04 − .06	55.65 .23	45.31 .10
July 8.5	44.39 +1.66	18.90 − .07	24.89 − .02	10.32 .00	2.42 + .07	9.91 − .19	55.81 + .10	45.39 + .05
18.4	46.24 1.99	18.81 .12	24.84 .07	10.30 − .04	2.46 + .02	9.66 .30	55.85 − .02	45.42 .00
28.4	48.37 2.29	18.67 .17	24.76 .11	10.23 .08	2.46 − .02	9.30 .42	55.77 .14	45.39 − .05
Aug. 7.4	50.83 2.56	18.47 .21	24.61 .16	10.13 .12	2.41 .07	8.82 .52	55.56 .26	45.33 .09
17.3	53.50 2.74	18.25 .24	24.44 .19	9.98 .16	2.32 .11	8.27 .60	55.25 .37	45.21 .13
27.3	56.32 +2.89	17.98 − .27	24.23 − .22	9.80 − .18	2.19 − .15	7.61 − .68	54.82 − .47	45.06 − .17
Sept. 6.3	59.28 2.99	17.70 .29	24.00 .24	9.61 .20	2.02 .17	6.90 .74	54.32 .54	44.87 .20
16.3	62.30 3.01	17.39 .31	23.74 .26	9.39 .22	1.84 .19	6.13 .78	53.74 .59	44.65 .22
26.2	65.31 2.98	17.09 .30	23.49 .25	9.17 .23	1.64 .20	5.34 .79	53.14 .61	44.43 .23
Oct. 6.2	68.26 2.91	16.79 .28	23.23 .25	8.94 .22	1.45 .19	4.54 .80	52.52 .62	44.19 .24
16.2	71.12 +2.81	16.52 − .26	22.99 − .24	8.73 − .20	1.26 − .18	3.75 − .79	51.91 − .61	43.96 − .23

Mean Solar Date.	ι Lyræ.	25 Camelop. S. P.	θ Lyræ.	β Cygni.	β Sagittæ.	δ Cygni.	Groombr. 1374,S.P.	ε Pavonis.
	54° 5′	352° 38′	52° 4′	62° 17′	72° 47′	45° 9′	344° 13′	163° 12′
	h m 19 3	h m 19 7	h m 19 12	h m 19 26	h m 19 35	h m 19 41	h m 19 46	h m 19 47
	s	s	s	s	s	s	s	s
May 29.6	18.04 + .23	8.57 − .70	28.56 + .24	11.56 + .23	60.00 + .24	28.52 + .27	36.24 − .38	34.80 + .78
June 8.6	18.25 .19	8.02 .40	28.78 .20	11.78 .21	60.23 .22	28.78 .24	35.92 .27	35.53 .68
18.6	18.43 .15	7.77 − .11	28.97 .16	11.98 .18	60.44 .19	29.01 .20	35.71 − .14	36.16 .59
28.5	18.55 .10	7.80 + .17	29.10 .12	12.14 .13	60.61 .15	29.18 .15	35.64 .00	36.70 .48
July 8.5	18.64 + .05	8.12 .45	29.20 .07	12.24 .09	60.73 .11	29.30 .10	35.71 + .12	37.11 .35
18.5	18.66 .00	8.71 + .73	29.23 + .02	12.31 + .05	60.82 + .07	29.37 + .03	35.89 + .24	37.40 + .22
28.4	18.64 − .04	9.59 .98	29.23 − .03	12.33 .00	60.86 + .02	29.36 − .03	36.20 .38	37.54 + .07
Aug. 7.4	18.58 .09	10.68 1.20	29.16 .09	12.30 − .05	60.85 − .03	29.32 .08	36.65 .49	37.53 − .07
17.4	18.46 .13	12.00 1.42	29.05 .14	12.22 .09	60.81 .07	29.21 .13	37.18 .58	37.39 .20
27.4	18.31 .17	13.52 1.61	28.89 .18	12.11 .13	60.71 .11	29.06 .17	37.82 .69	37.12 .33
Sept. 6.3	18.11 − .21	15.23 +1.76	28.69 − .21	11.95 − .17	60.59 − .14	28.86 − .22	38.57 + .78	36.73 − .45
16.3	17.89 .23	17.05 1.87	28.47 .23	11.77 .19	60.44 .16	28.62 .25	39.38 .84	36.22 .55
26.3	17.65 .24	18.98 1.97	28.22 .25	11.57 .21	60.26 .18	28.37 .27	40.26 .90	35.63 .61
Oct. 6.3	17.40 .25	20.99 2.03	27.96 .26	11.35 .22	60.07 .19	28.08 .28	41.18 .95	34.99 .65
16.2	17.16 .24	23.01 2.02	27.71 .25	11.14 .21	59.88 .19	27.79 .29	42.15 .98	34.32 .67
26.2	16.91 − .22	25.03 +1.99	27.46 − .24	10.93 − .20	59.69 − .18	27.51 − .29	43.14 + .98	33.65 − .65
Nov. 5.2	16.71 − .19	27.02 +1.94	27.23 − .23	10.74 − .18	59.52 − .16	27.22 − .28	44.13 + .99	33.01 − .63

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Sagittæ.	c Sagittarii.	θ Aquilæ.	31 Cygni.	α Delphini.	β Pavonis.	ψ Capricor.	ε Cygni.
	70° 49′	118° 1′	91° 9′	43° 36′	74° 29′	156° 36′	115° 41′	56° 27′
	h m 19 53	h m 19 55	h m 20 5	h m 20 10	h m 20 34	h m 20 34	h m 20 39	h m 20 41
	s	s	s	s	s	s	s	s
June 18.6	45.90 + .21	44.57 + .25	30.32 + .20	6.80 + .22	25.21 + .22	49.22 + .52	25.99 + .26	40.38 + .25
28.6	46.09 .17	44.80 .21	30.51 .18	7.00 .18	25.42 .20	49.71 .46	26.24 .24	40.61 .21
July 8.5	46.23 .12	44.98 .17	30.69 .15	7.16 .13	25.60 .16	50.13 .38	26.47 .21	40.81 .17
18.5	46.33 .08	45.13 .12	30.81 .10	7.27 .07	25.75 .12	50.46 .28	26.65 .16	40.95 .12
28.5	46.39 + .04	45.22 .07	30.89 .06	7.30 + .01	25.84 .07	50.69 .18	26.78 .11	41.04 .07
Aug. 7.5	46.40 − .01	45.26 + .01	30.93 + .02	7.29 − .04	25.89 + .03	50.82 + .07	26.87 + .06	41.09 + .02
17.4	46.36 .05	45.24 − .04	30.92 − .03	7.22 .10	25.91 − .01	50.83 − .03	26.90 .00	41.08 − .03
27.4	46.29 .09	45.19 .08	30.87 .07	7.09 .15	25.87 .06	50.75 .13	26.88 − .04	41.03 .07
Sept. 6.4	46.17 .13	45.09 .12	30.79 .10	6.91 .20	25.79 .09	50.56 .23	26.83 .08	40.94 .11
16.4	46.03 .16	44.95 .15	30.67 .13	6.69 .23	25.68 .12	50.28 .31	26.73 .12	40.80 .16
26.3	45.85 − .18	44.78 − .17	30.52 − .15	6.44 − .26	25.54 − .15	49.93 − .38	26.59 − .14	40.62 − .18
Oct. 6.3	45.67 .19	44.61 .18	30.37 .16	6.16 .28	25.38 .17	49.52 .43	26.44 .16	40.44 .20
16.3	45.48 .20	44.41 .20	30.20 .17	5.87 .29	25.20 .18	49.07 .46	26.26 .18	40.22 .22
26.2	45.28 .19	44.22 .18	30.03 .17	5.59 .29	25.02 .17	48.60 .46	26.08 .18	40.01 .22
Nov. 5.2	45.11 .17	44.05 .16	29.86 .15	5.30 .28	24.86 .16	48.14 .45	25.90 .16	39.79 .21
15.2	44.95 − .14	43.90 − .14	29.73 − .12	5.03 − .26	24.70 − .15	47.70 − .42	25.75 − .15	39.59 − .20
25.2	44.83 − .10	43.77 − .12	29.62 − .09	4.79 − .22	24.55 − .14	47.30 − .38	25.60 − .14	39.40 − .19

Mean Solar Date.	τ Cygni.	ζ Capricor.	74 Cygni.	λ¹ Octantis.	ζ Chamæleontis, S.P.	π² Cygni.	16 Pegasi.	π Pegasi.
	52° 26′	112° 54′	50° 6′	173° 14′	189° 34′	41° 13′	64° 36′	57° 23′
	h m 21 10	h m 21 20	h m 21 32	h m 21 33	h m 21 37	h m 21 42	h m 21 47	h m 22 4
	s	s	s	s	s	s	s	s
July 8.6	19.32 + .22	14.95 + .24	27.69 + .22	37.51 +1.41	6.66 − .82	39.87 + .26	57.41 + .25	60.38 + .27
18.6	19.51 .16	15.17 .20	27.89 .18	38.78 1.14	5.91 .68	40.10 .20	57.63 .19	60.62 .21
28.5	19.63 .10	15.34 .15	28.05 .14	39.78 .86	5.34 .48	40.27 .15	57.79 .14	60.80 .16
Aug. 7.5	19.71 + .05	15.46 .10	28.16 .08	40.49 .53	4.96 .26	40.39 .09	57.91 .10	60.94 .12
17.5	19.74 .00	15.53 + .05	28.20 + .02	40.84 + .20	4.79 − .06	40.44 + .02	57.99 .06	61.03 .07
27.5	19.71 − .05	15.56 .00	28.20 − .03	40.88 − .13	4.85 + .20	40.43 − .03	58.02 + .01	61.08 + .02
Sept. 6.4	19.63 .10	15.54 − .04	28.14 .08	40.57 .48	5.19 .43	40.38 .08	58.00 − .03	61.07 − .02
16.4	19.51 .14	15.48 .08	28.04 .12	39.91 .80	5.71 .62	40.27 .14	57.95 .07	61.03 .06
26.4	19.36 .17	15.37 .11	27.91 .16	38.97 1.08	6.43 .83	40.10 .19	57.86 .11	60.94 .10
Oct. 6.4	19.17 .20	15.25 .13	27.73 .19	37.75 1.32	7.38 1.03	39.89 .22	57.73 .13	60.83 .13
16.3	18.96 − .21	15.10 − .16	27.53 − .21	36.32 −1.50	8.49 +1.18	39.66 − .24	57.59 − .15	60.68 − .16
26.3	18.74 .22	14.93 .17	27.31 .22	34.74 1.64	9.74 1.28	39.41 .26	57.43 .16	60.51 .17
Nov. 5.3	18.53 .22	14.77 .16	27.09 .23	33.04 1.70	11.05 1.34	39.14 .27	57.26 .17	60.33 .18
15.2	18.31 .21	14.61 .15	26.86 .22	31.34 1.69	12.42 1.36	38.86 .28	57.08 .17	60.14 .19
25.2	18.10 .20	14.46 .13	26.65 .21	29.67 1.62	13.77 1.32	38.59 .26	56.92 .16	59.95 .18
Dec. 5.2	17.91 − .18	14.34 − .11	26.44 − .20	28.10 −1.51	15.05 +1.26	38.34 − .24	56.77 − .15	59.78 − .16

APPARENT RIGHT ASCENSIONS AND APPROXIMATE NORTH POLAR DISTANCES, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	υ Octantis.	γ Aquarii.	σ Aquarii.	α Lacertæ.	10 Lacertæ.	β Octantis.	λ Pegasi.	Groombr. 1706, S.P.
	176° 32′	91° 57′	101° 15′	40° 18′	51° 32′	171° 58′	67° 2′	348° 23′
	h m 22 9	h m 22 15	h m 22 24	h m 22 26	h m 22 34	h m 22 34	h m 22 41	h m 22 50
	s	s	s	s	s	s	s	s
July 8.6	57.07 +3.01	51.01 + .25	41.69 + .25	40.81 + .31	13.73 + .28	31.47 +1.39	7.24 + .28	49.01 − .67
18.6	59.85 2.55	51.24 .21	41.93 .23	41.10 .26	13.99 .24	32.79 1.25	7.50 .24	48.41 .53
28.6	62.16 2.04	51.44 .17	42.15 .20	41.34 .21	14.21 .20	33.96 1.06	7.72 .20	47.96 .39
Aug. 7.6	63.92 1.47	51.59 .13	42.32 .15	41.52 .15	14.39 .16	34.90 .82	7.89 .15	47.63 .27
17.5	65.09 .86	51.71 .09	42.44 .10	41.64 .09	14.52 .11	35.59 .56	8.02 .11	47.43 − .13
27.5	65.63 + .21	51.78 + .05	42.52 + .06	41 70 + .04	14.60 + .05	36.01 + .28	8.11 + .07	47.38 + .02
Sept. 6.5	65.51 − .45	51.81 + .01	42.57 + .02	41.71 − .02	14.62 .00	36.15 − .01	8.16 + .03	47.48 .19
16.4	64.72 1.09	51.80 − .03	42.57 − .02	41.66 .07	14.60 − .04	35.99 .30	8.16 − .01	47.76 .35
26.4	63.32 1.69	51.75 .06	42.53 .05	41.56 .12	14.54 .08	35.54 .57	8.13 .05	48.18 .50
Oct. 6.4	61.33 2.25	51.68 .08	42.46 .08	41.42 .16	14.44 .12	34.84 .81	8.06 .08	48.76 .64
16.4	58.82 −2.70	51.58 − .11	42.37 − .11	41.23 − .20	14.30 − .14	33.91 −1.03	7.96 − .10	49.47 + .77
26.3	55.92 3.06	51.46 .13	42.24 .12	41.02 .23	14.15 .16	32.78 1.21	7.84 .12	50.34 .91
Nov. 5.3	52.69 3.30	51.32 .14	42.12 .13	40.78 .25	13.97 .18	31.49 1.34	7.71 .13	51.32 1.03
15.3	49.31 3.40	51.19 .13	41.98 .14	40.52 .26	13.77 .19	30.10 1.41	7.57 .15	52.41 1.14
25.3	45.89 3.38	51.06 .13	41.84 .13	40.26 .26	13.58 .20	28.66 1.42	7.41 .16	53.61 1.21
Dec. 5.2	42.55 −3.21	50.93 − .12	41.72 − .12	40.00 − .26	13.38 − .20	27.26 −1.38	7.26 − .15	54.84 +1.24
15.2	39.47 −2.90	50.83 − .09	41.60 − .11	39.75 − .25	13.18 − .20	25.91 −1.32	7.12 − .14	56.10 +1.27

Mean Solar Date.	o Androm.	φ Aquarii.	τ Pegasi.	λ Androm.	i¹ Aquarii.	δ Sculptoris.	γ¹ Octantis.	33 Piscium.
	48° 17′	96° 39′	66° 53′	44° 9′	108° 54′	118° 45′	172° 39′	96° 20′
	h m 22 56	h m 23 8	h m 23 15	h m 23 32	h m 23 38	h m 23 43	h m 23 45	h m 23 59
	s	s	s	s	s	s	s	s
July 28.6	46.12 + .23	30.29 + .21	4.96 + .21	4.91 + .28	22.31 + .26	4.21 + .26	30.16 +1.47	34.92 + .24
Aug. 7.6	46.33 .19	30.49 .18	5.16 .19	5.17 .24	22.55 .22	4.46 .23	31.53 1.27	35.15 .22
17.6	46.49 .14	30.66 .15	5.34 .15	5.38 .18	22.75 .18	4.68 .20	32.69 1.04	35.37 .19
27.5	46.60 .09	30.78 .10	5.46 .10	5.53 .13	22.91 .14	4.85 .15	33.60 .77	35.53 .15
Sept. 6.5	46.66 + .03	30.86 .06	5.54 .07	5.64 .08	23.02 .10	4.98 .11	34.23 .48	35.66 .12
16.5	46.66 − .02	30.91 + .02	5.59 + .03	5.70 + .03	23.11 + .06	5.07 + .06	34.56 + .18	35.76 + .08
26.5	46.63 .06	30.91 − .01	5.60 − .01	5.71 − .01	23.14 + .01	5.10 + .02	34.59 − .14	35.82 + .04
Oct. 6.4	46.55 .10	30.88 .04	5.56 .05	5.68 .05	23.14 − .02	5.11 − .02	34.28 .45	35.83 .00
16.4	46.43 .13	30.83 .07	5.50 .08	5.60 .09	23.10 .05	5.06 .06	33.69 .73	35.82 − .03
26.4	46.29 .15	30.74 .10	5.40 .10	5.49 .13	23.04 .08	4.99 .09	32.81 1.00	35.78 .06
Nov. 5.3	46.12 − .18	30.63 − .11	5.30 − .11	5.34 − .16	22.94 − .11	4.88 − .11	31.69 −1.22	35.71 − .08
15.3	45.93 .19	30.52 .12	5.17 .13	5.17 .18	22.83 .11	4.77 .12	30.36 1.39	35.63 .09
25.3	45.73 .20	30.40 .13	5.03 .14	4.97 .20	22.71 .12	4.63 .14	28.91 1.50	35.53 .10
Dec. 5.3	45.52 .21	30.27 .12	4.89 .14	4.76 .21	22.58 .13	4.49 .15	27.35 1.57	35.43 .11
15.2	45.32 .20	30.16 .11	4.75 .14	4.55 .21	22.46 .13	4.34 .15	25.76 1.59	35.31 .12
25.2	45.13 − .20	30.05 − .09	4.61 − .14	4.33 − .22	22.33 − .12	4.20 − .14	24.18 −1.53	35.19 − .12
35.2	44.93 − .19	29.97 − .07	4.48 − .13	4.11 − .22	22.22 − .11	4.07 − .13	22.70 −1.43	35.08 − .11

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Jan. 1	18 48 0.34	1.06	−22 59 34.2	33.4	11.035	+12.64	+ 3 52.78	16 18.36	1 11.07	18 44 7.64
2	18 52 25.01	25.81	22 54 16.9	16.0	11.019	13.78	4 20.89	16 18.36	1 11.02	18 48 4.20
3	18 56 49.30	50.19	22 48 32.3	31.3	11.002	14.92	4 48.63	16 18.36	1 10.97	18 52 0.76
4	19 1 13.18	14.15	22 42 20.6	19.3	10.985	16.05	5 15.95	16 18.36	1 10.92	18 55 57.32
5	19 5 36.61	37.66	22 35 41.8	40.2	10.966	17.17	5 42.83	16 18.35	1 10.86	18 59 53.88
6	19 9 59.58	60.71	−22 28 36.2	34.3	10.947	+18.28	+ 6 9.26	16 18.32	1 10.80	19 3 50.43
7	19 14 22.06	23.26	22 21 4.0	1.9	10.926	19.38	6 35.19	16 18.29	1 10.74	19 7 46.99
8	19 18 44.03	45.30	22 13 5.5	3.1	10.904	20.48	7 0.61	16 18.26	1 10.67	19 11 43.55
9	19 23 5.47	6.81	22 4 40.8	38.1	10.881	21.56	7 25.49	16 18.22	1 10.59	19 15 40.11
10	19 27 26.35	27.76	21 55 50.3	47.3	10.858	22.64	7 49.82	16 18.18	1 10.51	19 19 36.66
11	19 31 46.66	48.14	−21 46 34.1	30.8	10.834	+23.70	+ 8 13.58	16 18.13	1 10.43	19 23 33.22
12	19 36 6.39	7.94	21 36 52.5	48.9	10.809	24.75	8 36.76	16 18.08	1 10.35	19 27 29.77
13	19 40 25.51	27.12	21 26 45.8	41.9	10.783	25.79	8 59.32	16 18.02	1 10.26	19 31 26.33
14	19 44 43.99	45.66	21 16 14.3	10.1	10.757	26.81	9 21.24	16 17.95	1 10.17	19 35 22.89
15	19 49 1.83	3.56	21 5 18.3	13.8	10.730	27.83	9 42.52	16 17.87	1 10.08	19 39 19.45
16	19 53 19.01	20.80	−20 53 58.0	53.2	10.702	+28.84	+10 3.16	16 17.79	1 9.99	19 43 16.00
17	19 57 35.52	37.36	20 42 13.9	8.7	10.673	29.83	10 23.11	16 17.71	1 9.89	19 47 12.56
18	20 1 51.33	53.23	20 30 6.2	0.7	10.644	30.81	10 42.36	16 17.62	1 9.79	19 51 9.11
19	20 6 6.43	8.38	20 17 35.3	29.5	10.614	31.77	11 0.90	16 17.53	1 9.69	19 55 5.67
20	20 10 20.80	22.80	20 4 41.4	35.3	10.584	32.72	11 18.72	16 17.43	1 9.58	19 59 2.22
21	20 14 34.44	36.48	−19 51 24.9	18.4	10.552	+33.65	+11 35.80	16 17.33	1 9.48	20 2 58.78
22	20 18 47.32	49.40	19 37 46.3	39.4	10.520	34.57	11 52.12	16 17.23	1 9.37	20 6 55.33
23	20 22 59.42	61.54	19 23 45.8	38.7	10.488	35.48	12 7.66	16 17.12	1 9.26	20 10 51.89
24	20 27 10.74	12.90	19 9 23.9	16.5	10.455	36.36	12 22.41	16 17.01	1 9.15	20 14 48.45
25	20 31 21.27	23.46	18 54 40.9	33.2	10.422	37.21	12 36.38	16 16.89	1 9.04	20 18 45.01
26	20 35 31.00	33.22	−18 39 37.3	29.2	10.388	+38.06	+12 49.55	16 16.77	1 8.93	20 22 41.56
27	20 39 39.90	42.15	18 24 13.4	5.0	10.354	38.91	13 1.89	16 16.65	1 8.82	20 26 38.12
28	20 43 47.96	50.24	18 8 29.5	20.8	10.319	39.73	13 13.39	16 16.52	1 8.71	20 30 34.67
29	20 47 55.20	57.49	17 52 26.1	17.0	10.284	40.54	13 24.06	16 16.39	1 8.60	20 34 31.23
30	20 52 1.60	3.91	17 35 63.7	54.3	10.249	41.33	13 33.90	16 16.26	1 8.48	20 38 27.78
31	20 56 7.15	9.48	−17 19 22.6	13.0	10.214	+42.10	+13 42.89	16 16.13	1 8.37	20 42 24.34
Feb. 1	21 0 11.86	14.21	17 2 23.2	13.4	10.179	42.85	13 51.04	16 15.99	1 8.25	20 46 20.89
2	21 4 15.74	18.10	16 44 65.9	55.9	10.144	43.58	13 58.36	16 15.84	1 8.14	20 50 17.45
3	21 8 18.78	21.15	16 27 31.2	20.9	10.110	44.30	14 4.84	16 15.69	1 8.02	20 54 14.00
4	21 12 20.98	23.36	16 9 39.5	28.9	10.075	45.00	14 10.48	16 15.54	1 7.91	20 58 10.55
5	21 16 22.35	24.74	−15 51 31.1	20.3	10.041	+45.68	+14 15.29	16 15.37	1 7.79	21 2 7.10
6	21 20 22.90	25.29	15 32 66.4	55.4	10.007	46.35	14 19.28	16 15.20	1 7.68	21 6 3.66
7	21 24 22.64	25.03	15 14 25.8	14.6	9.973	47.01	14 22.45	16 15.03	1 7.57	21 10 0.21
8	21 28 21.58	23.97	14 55 29.8	18.4	9.940	47.64	14 24.83	16 14.86	1 7.46	21 13 56.77
9	21 32 19.73	22.12	14 36 18.8	7.2	9.907	48.26	14 26.42	16 14.68	1 7.34	21 17 53.32
10	21 36 17.11	19.50	−14 16 53.1	41.3	9.875	+48.86	+14 27.24	16 14.49	1 7.23	21 21 49.88
11	21 40 13.72	16.10	13 57 13.2	1.3	9.843	49.45	14 27.29	16 14.30	1 7.12	21 25 46.43
12	21 44 9.57	11.94	13 37 19.5	7.4	9.812	50.02	14 26.58	16 14.11	1 7.01	21 29 42.99
13	21 48 4.68	7.04	13 17 12.3	0.1	9.782	50.58	14 25.12	16 13.91	1 6.90	21 33 39.54
14	21 51 59.06	61.41	12 56 52.0	39.7	9.752	51.10	14 22.94	16 13.71	1 6.79	21 37 36.10
15	21 55 52.73	55.06	−12 36 19.2	6.8	9.722	+51.63	+14 20.05	16 13.50	1 6.69	21 41 32.65
16	21 59 45.70	48.01	−12 15 34.2	21.7	9.693	+52.11	+14 16.46	16 13.29	1 6.58	21 45 29.21

Note.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.19$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″		s	″	m s	′ ″	m s	h m s
Feb. 16	21 59 45.70	48.01	−12 15 34.2	21.7	9.693	+52.11	+14 16.46	16 13.29	1 6.58	21 45 29.21
17	22 3 37.97	40.26	11 54 37.4	24.9	9.664	52.61	14 12.17	16 13.08	1 6.48	21 49 25.76
18	22 7 29.56	31.83	11 33 29.2	16.7	9.636	53.07	14 7.20	16 12.85	1 6.37	21 53 22.31
19	22 11 20.48	22.73	11 11 70.1	57.6	9.608	53.51	14 1.57	16 12.63	1 6.27	21 57 18.86
20	22 15 10.75	12.98	10 50 40.5	28.0	9.581	53.94	13 55.28	16 12.41	1 6.18	22 1 15.41
21	22 19 0.36	2.56	−10 28 60.7	48.2	9.554	+54.36	+13 48.33	16 12.19	1 6.08	22 5 11.96
22	22 22 49.33	51.50	10 6 71.2	58.7	9.528	54.75	13 40.75	16 11.97	1 5.99	22 9 8.52
23	22 26 37.69	39.83	9 45 12.5	0.0	9.502	55.13	13 32.54	16 11.74	1 5.90	22 13 5.07
24	22 30 25.43	27.54	9 22 65.0	52.5	9.477	55.46	13 23.72	16 11.51	1 5.81	22 17 1.63
25	22 34 12.57	14.65	9 0 49.0	36.6	9.452	55.83	13 14.30	16 11.28	1 5.73	22 20 58.18
26	22 37 59.12	61.17	− 8 38 25.1	12.8	9.428	+56.15	+13 4.30	16 11.05	1 5.64	22 24 54.73
27	22 41 45.09	47.11	8 15 53.6	41.4	9.404	56.46	12 53.72	16 10.82	1 5.56	22 28 51.28
28	22 45 30.51	32.49	7 53 14.8	2.8	9.381	56.75	12 42.58	16 10.59	1 5.49	22 32 47.84
Mar. 1	22 49 15.38	17.33	7 30 29.3	17.4	9.359	57.02	12 30.90	16 10.35	1 5.42	22 36 44.39
2	22 52 59.73	61.65	7 7 37.5	25.7	9.338	57.27	12 18.70	16 10.11	1 5.35	22 40 40.94
3	22 56 43.58	45.46	− 6 44 39.7	28.1	9.317	+57.52	+12 6.00	16 9.87	1 5.28	22 44 37.49
4	23 0 26.94	28.78	6 21 36.3	24.8	9.297	57.75	11 52.81	16 9.63	1 5.21	22 48 34.04
5	23 4 9.83	11.63	5 58 27.7	16.4	9.278	57.96	11 39.14	16 9.38	1 5.15	22 52 30.59
6	23 7 52.28	54.04	5 35 14.3	3.2	9.260	58.15	11 25.03	16 9.13	1 5.09	22 56 27.15
7	23 11 34.31	36.03	5 11 56.4	45.5	9.244	58.32	11 10.51	16 8.88	1 5.03	23 0 23.70
8	23 15 15.94	17.62	− 4 48 34.5	23.8	9.228	+58.48	+10 55.58	16 8.62	1 4.97	23 4 20.25
9	23 18 57.19	58.83	4 24 69.0	58.5	9.212	58.63	10 40.28	16 8.36	1 4.92	23 8 16.80
10	23 22 38.09	39.69	4 1 40.2	29.9	9.198	58.76	10 24.63	16 8.10	1 4.87	23 12 13.36
11	23 26 18.66	20.22	3 37 68.3	58.3	9.184	58.88	10 8.65	16 7.83	1 4.82	23 16 9.91
12	23 29 58.94	60.45	3 14 33.7	23.9	9.172	58.98	9 52.37	16 7.57	1 4.77	23 20 6.46
13	23 33 38.93	40.39	− 2 50 56.9	47.4	9.161	+59.06	+ 9 35.81	16 7.30	1 4.73	23 24 3.01
14	23 37 18.67	20.08	2 27 18.3	9.1	9.151	59.13	9 19.00	16 7.03	1 4.69	23 27 59.56
15	23 40 58.17	59.54	2 3 38.1	29.2	9.141	59.20	9 1.95	16 6.76	1 4.65	23 31 56.11
16	23 44 37.46	38.79	1 39 56.8	48.2	9.133	59.24	8 44.69	16 6.49	1 4.62	23 35 52.67
17	23 48 16.55	17 84	1 16 14.6	6.3	9.125	59.26	8 27.23	16 6.21	1 4.59	23 39 49.22
18	23 51 55.47	56.71	− 0 52 31.9	23.9	9.119	+59.27	+ 8 9.60	16 5.93	1 4.57	23 43 45.77
19	23 55 34.24	35.43	0 28 49.2	41.5	9.113	59.27	7 51.82	16 5.65	1 4.55	23 47 42.32
20	23 59 12.88	14.02	− 0 4 66.8	59.4	9.108	59.25	7 33.91	16 5.37	1 4.53	23 51 38.87
21	0 2 51.41	52.51	+ 0 18 35.0	42.1	9.103	59.22	7 15.89	16 5.09	1 4.51	23 55 35.42
22	0 6 29.84	30.00	0 42 15.8	22.6	9 099	59.17	6 57.77	16 4.81	1 4.50	23 59 31.98
23	0 10 8.18	9.20	+ 1 5 55.1	61.6	9.097	+59.10	+ 6 39.57	16 4.54	1 4.49	0 3 28.53
24	0 13 46.46	47.43	1 29 32.7	38.9	9.095	59.02	6 21.30	16 4.26	1 4.48	0 7 25.08
25	0 17 24.70	25.62	1 53 8.1	14.0	9.093	58.93	6 2.98	16 3.99	1 4.47	0 11 21.63
26	0 21 2.91	3.78	2 16 41.0	46.6	9.092	58.81	5 44.64	16 3.71	1 4.46	0 15 18.18
27	0 24 41.09	41.92	2 40 11.0	16.3	9.091	58.68	5 26.28	16 3.44	1 4.46	0 19 14.73
28	0 28 19.26	20.04	+ 3 3 37.8	42.8	9.091	+58.54	+ 5 7.91	16 3.16	1 4.46	0 23 11.29
29	0 31 57.46	58.19	3 27 0.9	5.6	9.092	58.38	4 49.56	16 2.89	1 4.47	0 27 7.84
30	0 35 35.70	36.38	3 50 20.0	24.4	9.094	58.21	4 31.25	16 2.61	1 4.48	0 31 4.39
31	0 39 14.00	14.63	4 13 34.7	38.8	9.097	58.02	4 13.00	16 2.34	1 4.49	0 35 0.94
32	0 42 52.37	52.96	4 36 44.8	48.6	9.101	57.81	3 54.82	16 2.07	1 4.51	0 38 57.50
33	0 46 30.83	31.38	+ 4 59 49.8	53.2	9.105	+57.59	+ 3 36.74	16 1.81	1 4.53	0 42 54.05
34	0 50 9.40	9.90	+ 5 22 49.3	52.4	9.110	+57.36	+ 3 18.76	16 1.54	1 4.55	0 46 50.60

Note.—For mean time interval of semidiameter passing meridian, subtract 0s.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Apr. 1	0 42 52.37	52.96	+ 4 36 44.8	48.6	9.101	+57.81	+3 54.82	16 2.07	1 4.51	0 38 57.50
2	0 46 30.83	31.38	4 59 49.8	53.2	9.105	57.59	3 36.74	16 1.81	1 4.53	0 42 54.05
3	0 50 9.40	9.90	5 22 49.3	52.4	9.110	57 36	3 18.76	16 1.54	1 4.55	0 46 50.60
4	0 53 48.11	48.57	5 45 43.1	45.9	9.116	57.11	3 0.92	16 1.27	1 4.57	0 50 47.15
5	0 57 26.98	27.39	6 8 30.8	33.3	9.123	56.85	2 43.23	16 1.00	1 4.60	0 54 43.71
6	1 1 6.02	6.39	+ 6 31 12.1	14.3	9.131	+56.58	+2 25.72	16 0.73	1 4.63	0 58 40.26
7	1 4 45.26	45.59	6 53 46.7	48.6	9 140	56.30	2 8.42	16 0.46	1 4.66	1 2 36.81
8	1 8 24.73	25.01	7 16 14.2	15.9	9.149	56.00	1 51.34	16 0.18	1 4.70	1 6 33.36
9	1 12 4.43	4.67	7 38 34.3	35.8	9.160	55.68	1 34.50	15 59.91	1 4.73	1 10 29.92
10	1 15 44.40	44.60	8 0 46.8	48.0	9.172	55.35	1 17.93	15 59.63	1 4.77	1 14 26.47
11	1 19 24.66	24.82	+ 8 22 51.2	52.2	9.184	+55.01	+1 1.64	15 59.36	1 4.81	1 18 23.02
12	1 23 5.22	5.34	8 44 47.3	48.1	9.197	54.65	0 45.65	15 59.08	1 4.86	1 22 19.57
13	1 26 46.10	46.18	9 6 34.8	35.3	9.211	54.29	0 29.98	15 58.81	1 4.90	1 26 16.13
14	1 30 27.33	27.37	9 28 13.2	13.5	9.225	53.91	+0 14.65	15 58.53	1 4.95	1 30 12.68
15	1 34 8.92	8.92	9 49 42.3	42.3	9.240	53.51	−0 0.31	15 58.26	1 5.00	1 34 9.23
16	1 37 50.88	50.84	+10 11 1.7	1.5	9.256	+53.10	−0 14.90	15 57.98	1 5.06	1 38 5.78
17	1 41 33.22	33.15	10 32 11.1	10.7	9.273	52.68	0 29.10	15 57.71	1 5.11	1 42 2.34
18	1 45 15.97	15.86	10 53 10.3	9.7	9.290	52.24	0 42.91	15 57.44	1 5.17	1 45 58.89
19	1 48 59.13	58.99	11 13 58.9	58.1	9.307	51.79	0 56.31	15 57.17	1 5.23	1 49 55.45
20	1 52 42.71	42.54	11 34 36.4	35.4	9.325	51.33	1 9.28	15 56.91	1 5.29	1 53 52.00
21	1 56 26.73	26.52	+11 55 2.5	1.3	9.343	+50.85	−1 21.81	15 56.65	1 5.35	1 57 48.55
22	2 0 11.19	10.94	12 15 17.0	15.6	9.362	50.35	1 33.90	15 56.39	1 5.41	2 1 45.10
23	2 3 56.11	55.82	12 35 19.4	17.9	9.381	49.85	1 45.54	15 56.13	1 5.48	2 5 41.66
24	2 7 41.48	41.17	12 55 9.4	7.8	9.400	49.33	1 56.72	15 55.89	1 5.55	2 9 38.21
25	2 11 27.32	26.98	13 14 46.8	45.1	9.420	48.78	2 7.43	15 55.64	1 5.62	2 13 34.77
26	2 15 13.64	13.27	+13 34 11.1	9.3	9.440	+48.23	−2 17.66	15 55.40	1 5.69	2 17 31.32
27	2 19 0.44	0.05	13 53 22.0	20.1	9.460	47.67	2 27.41	15 55.16	1 5.77	2 21 27.88
28	2 22 47.73	47.32	14 12 19.1	17.1	9.481	47.09	2 36.67	15 54.92	1 5.85	2 25 24.43
29	2 26 35.52	35.09	14 31 2.1	0.0	9.501	46.49	2 45.43	15 54.68	1 5.92	2 29 20.98
30	2 30 23.82	23.36	14 49 30.7	28.5	9.523	45.88	2 53.69	15 54.45	1 6.00	2 33 17.53
May 1	2 34 12.62	12.14	+15 7 44.6	42.3	9.545	+45.27	−3 1.44	15 54.22	1 6.07	2 37 14.09
2	2 38 1.95	1.45	15 25 43.4	41.0	9.566	44.63	3 8.67	15 53.99	1 6.15	2 41 10.64
3	2 41 51.81	51.29	15 43 26.9	24.5	9.587	43.99	3 15.37	15 53.76	1 6.23	2 45 7.20
4	2 45 42.21	41.67	16 0 54.8	52.3	9.609	43.33	3 21.53	15 53.54	1 6.31	2 49 3.75
5	2 49 33.16	32.60	16 18 6.7	4.2	9.633	42.66	3 27.14	15 53.31	1 6.39	2 53 0.31
6	2 53 24.65	24.08	+16 34 62.3	59.8	9.657	+41.97	−3 32.20	15 53.09	1 6.47	2 56 56.86
7	2 57 16.70	16.12	16 51 41.3	38.8	9.681	41.28	3 36.70	15 52.87	1 6.55	3 0 53.42
8	3 1 9.33	8.73	17 8 3.6	1.1	9.705	40.57	3 40.63	15 52.65	1 6.64	3 4 49.97
9	3 5 2.53	1.92	17 24 8.7	6.2	9.729	39.85	3 43.99	15 52.44	1 6.72	3 8 46.53
10	3 8 56.32	55.70	17 39 56.4	53.9	9.753	39.11	3 46.76	15 52.23	1 6.80	3 12 43.08
11	3 12 50.70	50.07	+17 55 26.4	23.9	9.777	+38.38	−3 48.94	15 52.01	1 6.89	3 16 39.64
12	3 16 45.66	45.03	18 10 38.5	36.1	9.802	37.63	3 50.54	15 51.80	1 6.97	3 20 36.19
13	3 20 41.21	40.57	18 25 32.3	30.0	9.827	36.87	3 51.54	15 51.59	1 7.05	3 24 32.75
14	3 24 37.35	36.71	18 40 7.6	5.4	9.852	36.08	3 51.95	15 51.39	1 7.13	3 28 29.30
15	3 28 34.09	33.45	18 54 24.1	21.9	9.877	35.30	3 51.77	15 51.18	1 7.21	3 32 25.86
16	3 32 31.42	30.78	+19 8 21.6	19.4	9.901	+34.50	−3 50.99	15 50.98	1 7.29	3 36 22.41
17	3 36 29.33	28.69	+19 21 59.7	57.5	9.925	+33.68	−3 49.63	15 50.78	1 7.37	3 40 18.97

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
May 17	3 36 29.33	28.69	+19 21 59.7	57.5	9.925	+33.68	−3 49.63	15 50.78	1 7.37	3 40 18.97
18	3 40 27.82	27.18	19 35 18.2	16.1	9.949	32.86	3 47.70	15 50.59	1 7.45	3 44 15.52
19	3 44 26.87	26.24	19 48 16.8	14.9	9.972	32.02	3 45.21	15 50.40	1 7.53	3 48 12.08
20	3 48 26.48	25.86	20 0 55.4	53.5	9.995	31.18	3 42.16	15 50.21	1 7.61	3 52 8.63
21	3 52 26.64	26.04	20 13 13.5	11.6	10.018	30.32	3 38.55	15 50.03	1 7.69	3 56 5.19
22	3 56 27.34	26.74	+20 25 10.8	9.0	10.041	+29.45	−3 34.41	15 49.85	1 7.76	4 0 1.74
23	4 0 28.57	27.98	20 36 47.2	45.5	10.062	28.57	3 29.74	15 49.68	1 7.83	4 3 58.30
24	4 4 30.31	29.73	20 48 2.5	0.9	10.083	27.69	3 24.56	15 49.52	1 7.90	4 7 54.86
25	4 8 32.56	31.99	20 58 56.4	54.9	10.104	26.79	3 18.87	15 49.36	1 7.97	4 11 51.42
26	4 12 35.28	34.73	21 9 28.5	27.1	10.123	25.88	3 12.70	15 49.20	1 8.04	4 15 47.97
27	4 16 38.47	37.94	+21 19 38.7	37.4	10.142	+24.96	−3 6.06	15 49.04	1 8.11	4 19 44.53
28	4 20 42.12	41.61	21 29 26.8	25.6	10.161	24.04	2 58.97	15 48.89	1 8.18	4 23 41.08
29	4 24 46.21	45.72	21 38 52.6	51.5	10.179	23.10	2 51.44	15 48.75	1 8.24	4 27 37.64
30	4 28 50.72	50.25	21 47 55.8	54.8	10.197	22.16	2 43.48	15 48.61	1 8.30	4 31 34.19
31	4 32 55.64	55.19	21 56 36.3	35.4	10.213	21.20	2 35.11	15 48.47	1 8.36	4 35 30.75
June 1	4 37 0.96	0.54	+22 4 53.8	53.0	10.229	+20.25	−2 26.35	15 48.34	1 8.42	4 39 27.31
2	4 41 6.67	6.28	22 12 48.2	47.5	10.245	19.28	2 17.20	15 48.21	1 8.48	4 43 23.87
3	4 45 12.75	12.39	22 20 19.4	18.8	10.261	18.31	2 7.68	15 48.09	1 8.53	4 47 20.42
4	4 49 19.18	18.85	22 27 27.2	26.6	10.275	17.33	1 57.81	15 47.96	1 8.58	4 51 16.98
5	4 53 25.95	25.65	22 34 11.3	10.8	10.289	16.35	1 47.59	15 47.84	1 8.63	4 55 13.53
6	4 57 33.05	32.78	+22 40 31.8	31.4	10.302	+15.36	−1 37.05	15 47.72	1 8.67	4 59 10.09
7	5 1 40.46	40.22	22 46 28.5	28.2	10.315	14.36	1 26.20	15 47.61	1 8.71	5 3 6.65
8	5 5 48.16	47.95	22 52 1.2	0.9	10.327	13.36	1 15.06	15 47.50	1 8.75	5 7 3.21
9	5 9 56.15	55.97	22 57 9.8	9.6	10.338	12.36	1 3.63	15 47.39	1 8.79	5 10 59.76
10	5 14 4.39	4.25	23 1 54.3	54.1	10.348	11.35	0 51.94	15 47.29	1 8.83	5 14 56.32
11	5 18 12.88	12.77	+23 6 14.5	14.4	10.358	+10.33	−0 40.00	15 47.19	1 8.86	5 18 52.87
12	5 22 21.59	21.51	23 10 10.3	10.3	10.367	9.31	0 27.85	15 47.09	1 8.88	5 22 49.43
13	5 26 30.50	30.46	23 13 41.7	41.7	10.375	8.29	0 15.49	15 47.00	1 8.90	5 26 45.99
14	5 30 39.60	39.60	23 16 48.5	48.5	10.382	7.27	−0 2.95	15 46.91	1 8.92	5 30 42.55
15	5 34 48.85	48.88	23 19 30.8	30.8	10.388	6.25	+0 9.75	15 46.83	1 8.94	5 34 39.10
16	5 38 58.24	58.30	+23 21 48.5	48.5	10.393	+ 5.22	+0 22.59	15 46.76	1 8.96	5 38 35.66
17	5 43 7.74	7.84	23 23 41.5	41.5	10.397	4.19	0 35.53	15 46.69	1 8.97	5 42 32.22
18	5 47 17.31	17.45	23 25 9.7	9.7	10.399	3.16	0 48.55	15 46.62	1 8.97	5 46 28.78
19	5 51 26.94	27.12	23 26 13.1	13.1	10.401	2.13	1 1.62	15 46.56	1 8.98	5 50 25.33
20	5 55 36.60	36.82	23 26 51.8	51.8	10.402	1.10	1 14.72	15 46.50	1 8.98	5 54 21.89
21	5 59 46.26	46.52	+23 27 5.7	5.7	10.402	+ 0.06	+1 27.82	15 46.44	1 8.98	5 58 18.45
22	6 3 55.89	56.19	23 26 54.8	54.8	10.400	− 0.97	1 40.89	15 46.39	1 8.97	6 2 15.01
23	6 8 5.47	5.80	23 26 19.1	19.0	10.397	2.00	1 53.92	15 46.35	1 8.96	6 6 11.56
24	6 12 14.95	15.32	23 25 18.6	18.4	10.393	3.04	2 6.86	15 46.31	1 8.95	6 10 8.12
25	6 16 24.33	24.73	23 23 53.3	53.1	10.388	4.07	2 19.68	15 46.28	1 8.94	6 14 4.67
26	6 20 33.57	34.01	+23 22 3.4	3.1	10.382	− 5.10	+2 32.36	15 46.25	1 8.92	6 18 1.23
27	6 24 42.65	43.13	23 19 48.8	48.5	10.374	6.12	2 44.88	15 46.23	1 8.90	6 21 57.79
28	6 28 51.54	52.06	23 17 9.6	9.3	10.366	7.15	2 57.22	15 46.21	1 8.87	6 25 54.35
29	6 33 0.23	0.78	23 14 5.9	5.5	10.357	8.17	3 9.35	15 46.19	1 8.84	6 29 50.90
30	6 37 8.69	9.27	23 10 37.8	37.3	10.347	9.19	3 21.25	15 46.18	1 8.81	6 33 47.46
31	6 41 16.89	17.51	+23 6 45.3	44.7	10.336	−10.20	+3 32.90	15 46.17	1 8.78	6 37 44.02
32	6 45 24.82	25.47	+23 2 28.6	27.9	10.324	−11.20	+3 44.27	15 46.17	1 8.74	6 41 40.58

Note.—For mean time interval of semidiameter passing meridian, subtract 0ˢ.19 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
July 1	6 41 16.89	17.51	+23 6 45.3	44.7	10.336	−10.20	+3 32.90	15 46.17	1 8.78	6 37 44.02
2	6 45 24.82	25.47	23 2 28.6	27.9	10.324	11.20	3 44.27	15 46.17	1 8.74	6 41 40.58
3	6 49 32.46	33.14	22 57 47.7	46.9	10.312	12.20	3 55.36	15 46.17	1 8.70	6 45 37.13
4	6 53 39.80	40.51	22 52 42.8	41.9	10.299	13.20	4 6.14	15 46.18	1 8.66	6 49 33.69
5	6 57 46.82	47.56	22 47 14.1	13.1	10.285	14.19	4 16.61	15 46.19	1 8.62	6 53 30.24
6	7 1 53.50	54.26	+22 41 21.6	20.5	10.271	−15.17	+4 26.73	15 46.20	1 8.57	6 57 26.80
7	7 5 59.82	60.60	22 35 5.4	4.2	10.256	16.16	4 36.49	15 46.22	1 8.52	7 1 23.36
8	7 10 5.77	6.58	22 28 25.8	24.5	10.241	17.14	4 45.88	15 46.24	1 8.47	7 5 19.92
9	7 14 11.35	12.18	22 21 22.8	21.4	10.224	18.11	4 54.90	15 46.26	1 8.41	7 9 16.47
10	7 18 16.53	17.39	22 13 56.8	55.3	10.207	19.07	5 3.53	15 46.29	1 8.35	7 13 13.03
11	7 22 21.31	22.19	+22 6 7.8	6.1	10.190	−20.02	+5 11.75	15 46.32	1 8.29	7 17 9.59
12	7 26 25.66	26.56	21 57 55.9	54.1	10.172	20.97	5 19.54	15 46.35	1 8.23	7 21 6.15
13	7 30 29.56	30.48	21 49 21.4	19.5	10.153	21.91	5 26.89	15 46.39	1 8.16	7 25 2.70
14	7 34 33.02	33.95	21 40 24.5	22.5	10 134	22.84	5 33.79	15 46.43	1 8.09	7 28 59.26
15	7 38 36.01	36.96	21 31 5.4	3.2	10.115	23.75	5 40.21	15 46.48	1 8.02	7 32 55.82
16	7 42 38.51	39.48	+21 21 24.3	22.0	10.095	−24.66	+5 46.15	15 46.53	1 7.95	7 36 52.38
17	7 46 40.51	41.50	21 11 21.4	19.0	10.073	25.57	5 51.60	15 46.59	1 7.88	7 40 48.93
18	7 50 42.01	43.00	21 0 57.0	54.4	10.051	26.46	5 56.54	15 46.65	1 7.80	7 44 45.49
19	7 54 42.98	43.98	20 50 11.2	8.5	10.029	27.35	6 0.95	15 46.71	1 7.72	7 48 42.04
20	7 58 43.40	44.41	20 39 4.3	1.5	10.006	28.22	6 4.82	15 46.79	1 7.64	7 52 38.60
21	8 2 43.26	44.28	+20 27 36.5	33.6	9.982	−29.08	+6 8.13	15 46.87	1 7.56	7 56 35.15
22	8 6 42.55	43.58	20 15 48.1	45.1	9.958	29.93	6 10.86	15 46.95	1 7.48	8 0 31.71
23	8 10 41.26	42.30	20 3 39.3	36.2	9.934	30.78	6 13.01	15 47.04	1 7.40	8 4 28.26
24	8 14 39.39	40.42	19 51 10.5	7.3	9.910	31.61	6 14.58	15 47.14	1 7.32	8 8 24.82
25	8 18 36.91	37.94	19 38 21.9	18.6	9.885	32.43	6 15.55	15 47.24	1 7.23	8 12 21.37
26	8 22 33.82	34.85	+19 25 13.7	10.3	9.859	−33.24	+6 15.90	15 47.34	1 7.15	8 16 17.93
27	8 26 30.12	31.15	19 11 46.2	42.7	9.833	34.04	6 15.64	15 47.45	1 7.06	8 20 14.48
28	8 30 25.81	26.84	18 57 59.7	56.1	9 807	34.83	6 14.77	15 47.57	1 6.98	8 24 11.04
29	8 34 20.88	21.90	18 43 54.5	50.8	9.781	35.60	6 13.28	15 47.69	1 6.89	8 28 7.59
30	8 38 15.33	16.34	18 29 30.8	27.1	9.755	36.36	6 11.17	15 47.81	1 6.81	8 32 4.15
31	8 42 9.15	10.15	+18 14 48.9	45.1	9.729	−37.12	+6 8.43	15 47.94	1 6.72	8 36 0.71
Aug. 1	8 46 2.35	3.34	17 59 49.1	45.3	9.704	37.86	6 5.08	15 48.07	1 6.64	8 39 57.27
2	8 49 54.94	55.92	17 44 31.7	27.8	9.679	38.58	6 1.11	15 48.20	1 6.55	8 43 53.82
3	8 53 46.92	47.89	17 28 57.0	53.1	9.654	39.29	5 56.53	15 48.33	1 6.47	8 47 50.38
4	8 57 38.29	39.24	17 13 5.3	1.4	9.629	40.00	5 51.34	15 48.47	1 6.38	8 51 46.93
5	9 1 29.07	30.00	+16 56 56.8	52.9	9.604	−40.70	+5 45.56	15 48.61	1 6.30	8 55 43.49
6	9 5 19.26	20.17	16 40 31.9	28.0	9.579	41.37	5 39.19	15 48.75	1 6.21	8 59 40.04
7	9 9 8.86	9.75	16 23 50.8	46.9	9.555	42.04	5 32.24	15 48.89	1 6.12	9 3 36.60
8	9 12 57.89	58.76	16 6 53.8	49.9	9.531	42.70	5 24.71	15 49.04	1 6.03	9 7 33.15
9	9 16 46.35	47.19	15 49 41.2	37.3	9.508	43.34	5 16.62	15 49.19	1 5.95	9 11 29.70
10	9 20 34.25	35.06	+15 32 13.2	9.4	9.485	−43.97	+5 7.97	15 49.34	1 5.86	9 15 26.25
11	9 24 21.60	22.38	15 14 30.3	26.5	9.462	44.59	4 58.77	15 49.50	1 5.78	9 19 22.81
12	9 28 8.41	9.16	14 56 32.7	29.0	9.439	45.20	4 49.02	15 49.66	1 5.70	9 23 19.36
13	9 31 54.68	55.40	14 38 20.6	17.0	9.417	45.79	4 38.73	15 49.83	1 5.62	9 27 15.92
14	9 35 40.43	41.12	14 19 54.5	51.0	9.395	46.37	4 27.92	15 50.00	1 5.54	9 31 12.47
15	9 39 25.65	26.31	+14 1 14.7	11.3	9.373	−46.94	+4 16.59	15 50.17	1 5.46	9 35 9.03
16	9 43 10.34	10.97	+13 42 21.5	18.2	9.351	−47.50	+4 4.74	15 50.35	1 5.39	9 39 5.58

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^s.19$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Aug. 16	9 43 10.34	10.97	+13 42 21.5	18.2	9.351	−47.50	+4 4.74	15 50.35	1 5.39	9 39 5.58
17	9 46 54.53	55.13	13 23 15.1	11.9	9.330	48.03	3 52.38	15 50.53	1 5.31	9 43 2.14
18	9 50 38.22	38.78	13 3 55.9	52.9	9.309	48.56	3 39.51	15 50.72	1 5.24	9 46 58.69
19	9 54 21.41	21.94	12 44 24.2	21.3	9.288	49.08	3 26.15	15 50.91	1 5.17	9 50 55.24
20	9 58 4.12	4.61	12 24 40.4	37.7	9.268	49.58	3 12.30	15 51.10	1 5.10	9 54 51.79
21	10 1 46.35	46.80	+12 4 44.8	42.3	9.249	−50.06	+2 57.97	15 51.30	1 5.03	9 58 48.35
22	10 5 28.10	28.52	11 44 37.7	35.4	9.230	50.53	2 43.17	15 51.51	1 4.96	10 2 44.90
23	10 9 9.39	9.77	11 24 19.5	17.4	9.211	50.99	2 27.92	15 51.72	1 4.89	10 6 41.46
24	10 12 50.23	50.57	11 3 50.5	48.6	9.193	51.43	2 12.21	15 51.94	1 4.83	10 10 38.01
25	10 16 30.64	30.94	10 43 11.0	9.3	9.175	51.86	1 56.07	15 52.16	1 4.77	10 14 34.56
26	10 20 10.63	10.89	+10 22 21.3	19.8	9.157	−52.28	+1 39.50	15 52.38	1 4.71	10 18 31.11
27	10 23 50.20	50.42	10 1 21.8	20.5	9.141	52.68	1 22.51	15 52.60	1 4.65	10 22 27.67
28	10 27 29.39	29.56	9 40 12.8	11.8	9.125	53.07	1 5.14	15 52.82	1 4.60	10 26 24.22
29	10 31 8.19	8.32	9 18 54.7	53.9	9.110	53.45	0 47.40	15 53.04	1 4.55	10 30 20.78
30	10 34 46.64	46.72	8 57 27.7	27.2	9 095	53.81	0 29.31	15 53.27	1 4.50	10 34 17.33
31	10 38 24.75	24.78	+8 35 52.1	51.9	9.081	−54.15	+0 10.87	15 53.50	1 4.45	10 38 13.89
Sept. 1	10 42 2.54	2.52	8 14 8.3	8.3	9.068	54.49	−0 7.89	15 53.73	1 4.41	10 42 10.44
2	10 45 40.03	39.97	7 52 16.5	16.8	9.057	54.82	0 26.95	15 53.96	1 4.37	10 46 6.99
3	10 49 17.25	17.14	7 30 17.1	17.7	9.046	55.12	0 46.28	15 54.20	1 4.33	10 50 3.54
4	10 52 54.21	54.05	7 8 10.5	11.4	9.036	55.42	1 5.86	15 54.43	1 4.29	10 54 0.09
5	10 56 30.93	30.72	+6 45 56.8	58.0	9.026	−55.71	−1 25.68	15 54.67	1 4.25	10 57 56.64
6	11 0 7.44	7.18	6 23 36.4	37.9	9.017	55.99	1 45.72	15 54.91	1 4.22	11 1 53.20
7	11 3 43.76	43.45	6 1 9.7	11.5	9.009	56.24	2 5.95	15 55.15	1 4.19	11 5 49.75
8	11 7 19.91	19.55	5 38 36.8	39.0	9.003	56.49	2 26.36	15 55.39	1 4.17	11 9 46.30
9	11 10 55.91	55.49	5 15 58.2	60.7	8 997	56.72	2 46.91	15 55.63	1 4.14	11 13 42.85
10	11 14 31.77	31.30	+4 53 14.1	16.9	8.992	−56.93	−3 7.58	15 55.87	1 4.12	11 17 39.40
11	11 18 7.53	7.01	4 30 25.0	28.2	8.988	57.13	3 28.37	15 56.12	1 4.10	11 21 35.95
12	11 21 43.19	42.62	4 7 31.0	34.5	8.984	57.31	3 49.26	15 56.37	1 4.08	11 25 32.50
13	11 25 18.77	18.15	3 44 32.6	36.4	8.982	57.50	4 10.22	15 56.62	1 4.07	11 29 29.05
14	11 28 54.29	53.62	3 21 30.1	34.3	8.980	57.68	4 31.25	15 56.88	1 4.06	11 33 25.61
15	11 32 29.77	29.05	+2 58 23.8	28.4	8.978	−57.83	−4 52.32	15 57.14	1 4.05	11 37 22.16
16	11 36 5.22	4.45	2 35 14.0	19.0	8.977	57.96	5 13.42	15 57.40	1 4.05	11 41 18.72
17	11 39 40.66	39.83	2 12 1.2	6.5	8.977	58.09	5 34.52	15 57.66	1 4.05	11 45 15.27
18	11 43 16.10	15.22	1 48 45.6	51.2	8.978	58.20	5 55.62	15 57.92	1 4.06	11 49 11.82
19	11 46 51.57	50.64	1 25 27.7	33.7	8.979	58.29	6 16.70	15 58.19	1 4.06	11 53 8.37
20	11 50 27.09	26.11	+1 2 7.7	14.1	8.981	−58.36	−6 37.74	15 58.46	1 4.07	11 57 4.92
21	11 54 2.66	1.62	0 38 46.1	52.8	8.984	58.43	6 58.72	15 58.73	1 4.08	12 1 1.47
22	11 57 38.29	37.20	+0 15 23.2	30.2	8.987	58.48	7 19.63	15 59.00	1 4.09	12 4 58.03
23	12 1 14.02	12.88	−0 7 60.6	53.2	8.991	58 50	7 40.45	15 59.28	1 4.11	12 8 54.58
24	12 4 49.86	48.67	0 31 25.0	17.3	8.996	58.52	8 1.16	15 59.56	1 4.13	12 12 51.14
25	12 8 25.84	24.59	−0 54 49.7	41.6	9.002	−58.53	−8 21.73	15 59.84	1 4.16	12 16 47.69
26	12 12 1.96	0.66	1 18 14.3	5.8	9.009	58.52	8 42.16	16 0.12	1 4.19	12 20 44.24
27	12 15 38.26	36.91	1 41 38.4	29.6	9.017	58.49	9 2.41	16 0.40	1 4.22	12 24 40.79
28	12 19 14.75	13.35	2 4 61.8	52.7	9.026	58.45	9 22.45	16 0.68	1 4.25	12 28 37.34
29	12 22 51.47	50.01	2 28 24.0	14.6	9.035	58.40	9 42.28	16 0.96	1 4.29	12 32 33.89
30	12 26 28.43	26.92	−2 51 44.7	35.0	9.045	−58.32	−10 1.89	16 1.24	1 4.33	12 36 30.45
31	12 30 5.65	4.09	−3 14 63.6	53.6	9.057	−58.24	−10 21.22	16 1.52	1 4.37	12 40 27.00

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0^{s}.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Oct. 1	12 30 5.65	4.09	− 3 14 63.6	53.6	9.057	−58.94	−10 21.22	16 1.52	1 4.37	12 40 27.00
2	12 33 43.16	41.55	3 38 20.3	10.0	9.070	58.15	10 40.25	16 1.80	1 4.41	12 44 23.55
3	12 37 20.99	19.33	4 1 34.6	24.0	9.083	58.03	10 58.97	16 2.07	1 4.46	12 48 20.10
4	12 40 59.16	57.45	4 24 46.0	35.1	9.098	57.91	11 17.35	16 2.35	1 4.51	12 52 16.66
5	12 44 37.70	35.94	4 47 54.3	43.1	9.114	57.77	11 35.37	16 2.62	1 4.57	12 56 13.21
6	12 48 16.61	14.81	− 5 10 59.0	47.6	9.131	−57.62	−11 53.01	16 2.90	1 4.62	13 0 9.76
7	12 51 55.93	54.08	5 33 59.9	48.3	9.148	57.45	12 10.24	16 3.17	1 4.68	13 4 6.31
8	12 55 35.68	33.78	5 56 56.6	44.7	9.166	57.26	12 27.03	16 3.45	1 4.74	13 8 2.86
9	12 59 15.89	13.94	6 19 48.8	36.7	9.185	57.06	12 43.38	16 3.72	1 4.81	13 11 59.41
10	13 2 56.56	54.57	6 42 36.0	23.7	9.205	56.85	12 59.26	16 3.99	1 4.87	13 15 55.97
11	13 6 37.72	35.69	− 7 5 17.9	5.4	9.226	−56.63	−13 14.65	16 4.26	1 4.94	13 19 52.52
12	13 10 19.39	17.31	7 27 54.1	41.4	9.248	56.38	13 29.53	16 4.53	1 5.01	13 23 49.07
13	13 13 61.59	59.47	7 50 24.3	11.4	9.270	56.12	13 43.89	16 4.81	1 5.09	13 27 45.63
14	13 17 44.33	42.17	8 12 48.1	35.0	9.293	55.85	13 57.71	16 5.08	1 5.17	13 31 42.18
15	13 21 27.62	25.42	8 34 65.1	51.9	9.316	55.55	14 10.99	16 5.35	1 5.25	13 35 38.73
16	13 25 11.47	9.23	− 8 57 14.8	1.5	9.340	−55.24	−14 23.69	16 5.62	1 5.33	13 39 35.29
17	13 28 55.90	53.62	9 19 16.9	3.5	9.364	54.92	14 35.81	16 5.90	1 5.42	13 43 31.84
18	13 32 40.93	38.61	9 40 70.9	57.4	9.389	54.58	14 47.33	16 6.17	1 5.51	13 47 28.39
19	13 36 26.57	24.22	10 2 56.5	42.9	9.415	54.22	14 58.25	16 6.44	1 5.60	13 51 24.94
20	13 40 12.84	10.45	10 24 33.2	19.5	9.441	53.85	15 8.55	16 6.71	1 5.69	13 55 21.50
21	13 43 59.73	57.31	−10 45 60.6	46.9	9.468	−53.45	−15 18.21	16 6.99	1 5.79	13 59 18.05
22	13 47 47.27	44.82	11 7 18.4	4.7	9.495	53.03	15 27.23	16 7.26	1 5.89	14 3 14.60
23	13 51 35.48	33.00	11 28 26.1	12.4	9.523	52.61	15 35.59	16 7.53	1 5.99	14 7 11.15
24	13 55 24.36	21.85	11 49 23.2	9.5	9.551	52.15	15 43.27	16 7.80	1 6.09	14 11 7.71
25	13 59 13.93	11.39	12 9 69.4	55.7	9.580	51.69	15 50.26	16 8.08	1 6.20	14 15 4.26
26	14 3 4.21	1.65	−12 30 44.3	30.6	9.609	−51.21	−15 56.54	16 8.35	1 6.30	14 19 0.82
27	14 6 55.21	52.63	12 50 67.5	53.9	9.639	50.71	16 2.11	16 8.61	1 6.41	14 22 57.37
28	14 10 46.93	44.33	13 11 18.7	5.2	9.670	50.20	16 6.94	16 8.87	1 6.52	14 26 53.92
29	14 14 39.40	36.78	13 31 17.4	4.0	9.702	49.67	16 11.03	16 9.13	1 6.63	14 30 50.47
30	14 18 32.63	29.99	13 50 63.2	49.9	9.734	49.13	16 14.36	16 9.38	1 6.74	14 34 47.03
31	14 22 26.64	23.99	−14 10 35.6	22.4	9.767	−48.57	−16 16.92	16 9.63	1 6.85	14 38 43.58
Nov. 1	14 26 21.44	18.78	14 29 54.3	41.3	9.800	47.98	16 18.69	16 9.88	1 6.96	14 42 40.14
2	14 30 17.04	14.38	14 48 59.1	46.2	9.834	47.39	16 19.65	16 10.13	1 7.08	14 46 36.69
3	14 34 13.47	10.79	15 7 49.4	36.6	9.868	46.78	16 19.79	16 10.37	1 7.19	14 50 33.25
4	14 38 10.72	8.03	15 26 24.9	12.3	9.903	46.16	16 19.10	16 10.61	1 7.31	14 54 29.80
5	14 42 8.80	6.10	−15 44 45.2	32.8	9.938	−45.51	−16 17.58	16 10.85	1 7.43	14 58 26.36
6	14 46 7.74	5.04	16 2 49.9	37.7	9.973	44.86	16 15.21	16 11.08	1 7.55	15 2 22.91
7	14 50 7.53	4.83	16 20 38.5	26.5	10.009	44.18	16 11.99	16 11.31	1 7.67	15 6 19.47
8	14 54 8.18	5.48	16 37 70.8	59.0	10.045	43.50	16 7.90	16 11.54	1 7.79	15 10 16.02
9	14 58 9.69	6.99	16 55 26.3	14.7	10.081	42.79	16 2.95	16 11.77	1 7.91	15 14 12.58
10	15 2 12.07	9.38	−17 12 24.6	13.4	10.117	−42.06	−15 57.13	16 11.99	1 8.03	15 18 9.13
11	15 6 15.31	12.63	17 28 65.3	54.4	10.153	41.32	15 50.45	16 12.21	1 8.15	15 22 5.69
12	15 10 19.42	16.75	17 45 27.8	17.2	10.189	40.56	15 42.91	16 12.43	1 8.27	15 26 2.24
13	15 14 24.39	21.73	18 1 31.9	21.6	10.224	39.78	15 34.50	16 12.64	1 8.39	15 29 58.80
14	15 18 30.22	27.57	18 17 17.3	7.3	10.260	38.99	15 25.24	16 12.85	1 8.51	15 33 55.35
15	15 22 36.89	34.27	−18 32 43.4	33.7	10.295	−38.17	−15 15.13	16 13.06	1 8.62	15 37 51.91
16	15 26 44.41	41.82	−18 47 49.9	40.5	10.330	−37.35	−15 4.17	16 13.27	1 8.73	15 41 48.46

NOTE.—*For mean time interval of semidiameter passing meridian, subtract $0^s.18$ from the sidereal interval.*

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Nov. 16	15 26 44.41	41.82	−18 47 49.9	40.5	10.330	−37.35	−15 4.17	16 13.27	1 8.73	15 41 48.46
17	15 30 52.77	50.21	19 2 36.3	27.3	10.365	36.51	14 52.37	16 13.48	1 8.85	15 45 45.02
18	15 34 61.95	59.42	19 16 62.2	53.5	10.399	35.64	14 39.75	16 13.68	1 8.96	15 49 41.57
19	15 39 11.95	9.45	19 30 67.3	58.9	10.433	34.77	14 26.32	16 13.89	1 9.08	15 53 38.13
20	15 43 22.75	20.28	19 44 51.1	43.1	10.467	33.88	14 12.08	16 14.09	1 9.19	15 57 34.68
21	15 47 34.34	31.90	−19 58 13.3	5.6	10.500	−32.96	−13 57.05	16 14.29	1 9.30	16 1 31.24
22	15 51 46.71	44.31	20 11 13.5	6.2	10.532	32.04	13 41.24	16 14.49	1 9.41	16 5 27.79
23	15 55 59.85	57.49	20 23 51.4	44.4	10.563	31.11	13 24.66	16 14.68	1 9.52	16 9 24.35
24	16 0 13.75	11.43	20 36 6.6	0.0	10.594	30.15	13 7.32	16 14.87	1 9.63	16 13 20.91
25	16 4 28.40	26.13	20 47 58.7	52.5	10.625	29.19	12 49.23	16 15.05	1 9.74	16 17 17.47
26	16 8 43.78	41.56	−20 59 27.5	21.6	10.655	−28.21	−12 30.41	16 15.23	1 9.85	16 21 14.02
27	16 12 59.87	57.70	21 10 32.6	27.1	10.685	27.21	12 10.87	16 15.40	1 9.95	16 25 10.58
28	16 17 16.67	14.55	21 21 13.7	8.6	10.714	26.21	11 50.63	16 15.56	1 10.04	16 29 7.13
29	16 21 34.17	32.11	21 31 30.5	25.7	10.743	25.19	11 29.69	16 15.72	1 10.14	16 33 3.69
30	16 25 52.34	50.34	21 41 22.7	18.3	10.771	24.16	11 8.07	16 15.88	1 10.23	16 37 0.24
Dec. 1	16 30 11.17	9.23	−21 50 50.0	45.9	10.798	−23.12	−10 45.80	16 16.03	1 10.32	16 40 56.80
2	16 34 30.65	28.77	21 59 52.2	48.4	10.825	22.06	10 22.88	16 16.18	1 10.40	16 44 53.36
3	16 38 50.75	48.94	22 8 28.9	25.4	10.850	20.99	9 59.34	16 16.32	1 10.48	16 48 49.92
4	16 43 11.46	9.72	22 16 40.0	36.8	10.875	19.92	9 35.18	16 16.45	1 10.56	16 52 46.47
5	16 47 32.75	31.08	22 24 25.2	22.3	10.899	18.84	9 10.44	16 16.58	1 10.63	16 56 43.03
6	16 51 54.61	53.01	−22 31 44.3	41.7	10.922	−17.75	− 8 45.13	16 16.70	1 10.70	17 0 39.59
7	16 56 17.01	15.49	22 38 37.0	34.7	10.943	16.65	8 19.28	16 16.81	1 10.77	17 4 36.15
8	17 0 39.92	38.49	22 45 3.1	0.9	10.964	15.53	7 52.93	16 16.92	1 10.84	17 8 32.70
9	17 5 3.32	1.97	22 51 2.4	0.4	10.984	14.41	7 26.08	16 17.03	1 10.90	17 12 29.26
10	17 9 27.17	25.89	22 56 34.7	33.0	11.002	13.28	6 58.78	16 17.14	1 10.96	17 16 25.81
11	17 13 51.43	50.23	−23 1 39.8	38.4	11.019	−12.15	− 6 31.07	16 17.25	1 11.01	17 20 22.37
12	17 18 16.08	14.97	23 6 17.6	16.4	11.035	11.01	6 2.96	16 17.35	1 11.06	17 24 18.93
13	17 22 41.10	40.07	23 10 27.9	26.9	11.049	9.86	5 34.50	16 17.45	1 11.11	17 28 15.49
14	17 27 6.43	5.49	23 14 10.5	9.7	11.061	8.70	5 5.71	16 17.54	1 11.15	17 32 12.04
15	17 31 32.05	31.19	23 17 25.3	24.7	11.072	7.54	4 36.64	16 17.63	1 11.18	17 36 8.60
16	17 35 57.91	57.15	−23 20 12.1	11.7	11.082	− 6.37	− 4 7.33	16 17.72	1 11.21	17 40 5.16
17	17 40 23.97	23.30	23 22 30.9	30.6	11.090	5.20	3 37.82	16 17.80	1 11.23	17 44 1.72
18	17 44 50.21	49.63	23 24 21.7	21.5	11.096	4.02	3 8.12	16 17.88	1 11.25	17 47 58.27
19	17 49 16.58	16.09	23 25 44.3	44.2	11.101	2.85	2 38.30	16 17.95	1 11.27	17 51 54.83
20	17 53 43.03	42.63	23 26 38.5	38.5	11.103	1.67	2 8.39	16 18.02	1 11.28	17 55 51.39
21	17 58 9.55	9.24	−23 27 4.5	4.5	11.105	− 0.49	− 1 38.43	16 18.09	1 11.29	17 59 47.95
22	18 2 36.10	35.89	23 27 2.2	2.2	11.106	+ 0.69	1 8.43	16 18.15	1 11.30	18 3 44.50
23	18 7 2.63	2.51	23 26 31.6	31.6	11.105	1.87	0 38.44	16 18.21	1 11.30	18 7 41.06
24	18 11 29.12	29.09	23 25 32.6	32.6	11.102	3.05	− 0 8.50	16 18.26	1 11.29	18 11 37.62
25	18 15 55.53	55.59	23 24 5.3	5.3	11.098	4.23	+ 0 21.36	16 18.31	1 11.28	18 15 34.18
26	18 20 21.82	21.98	−23 22 9.9	9.8	11.093	+ 5.40	+ 0 51.11	16 18.35	1 11.27	18 19 30.73
27	18 24 47.98	48.23	23 19 46.3	46.1	11.086	6.57	1 20.72	16 18.37	1 11.25	18 23 27.29
28	18 29 13.96	14.30	23 16 54.5	54.3	11.078	7.74	1 50.15	16 18.39	1 11.22	18 27 23.85
29	18 33 39.74	40.17	23 13 34.7	34.4	11.070	8.91	2 19.39	16 18.41	1 11.19	18 31 20.41
30	18 38 5.30	5.82	23 9 47.0	46.6	11.060	10.07	2 48.40	16 18.43	1 11.16	18 35 16.96
31	18 42 30.60	31.21	−23 5 31.5	31.0	11.048	+11.22	+ 3 17.15	16 18.44	1 11.13	18 39 13.52
32	18 46 55.61	56.30	−23 0 48.3	47.6	11.036	+12.37	+ 3 45.62	16 18.44	1 11.09	18 43 10.08

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0^{s}.19 from the sidereal interval.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.		
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″			
Jan. 0	4 56.47	1.759	23 37 27.86	115.69	− 4 42 28.8	+582.9	61.29	14 47.7	54 11.1	I.		S.
1	5 38.58	1.756	0 23 37.94	115.49	− 0 45 7.8	602.4	61.27	14 50.4	54 20.9	I.		S.
2	6 21.03	1.787	1 10 8.41	117.39	+ 3 16 31.3	602.5	61.78	14 56.0	54 41.8	I.		S.
3	7 4.66	1.855	1 57 50.02	121.44	7 14 0.2	580.9	62.84	15 4.5	55 13.3	I.		S.
4	7 50 31	1.955	2 47 33.03	127.47	10 57 48.4	533.1	64.39	15 15.8	55 54.4	I.		S.
5	8 38.72	2.083	3 40 1.89	135.14	+14 16 14.6	+452.3	66.30	15 28.9	56 42.6	I.		S.
6	9 30.37	2.223	4 35 46.25	143.58	16 55 9.7	334.8	68.34	15 43.2	57 35.1	I.		S.
7	10 25.32	2.352	5 34 48.55	151.37	18 38 52.0	+177.2	70.18	15 57.2	58 26.5	I.		S.
8	11 22.96	2.442	6 36 33.29	156.84	19 12 44.8	− 12.0	71.45	16 9.8	59 12.7	I.		S.
9	12 22.10	2.475	7 39 47.78	158.71	18 27 26.7	−214.9	71.89	16 19.6	59 48.8	II.		S.
10	13 21.23	2.443	8 43 1.93	156.88	+16 22 35.8	−405.5	71.49	16 25.7	60 11.0	II.		S.
11	14 19.06	2.370	9 44 57.54	152.47	13 7 51.8	−560.2	70.47	16 27.6	60 17.9	II.		S.
12	15 14.88	2.282	10 44 52.56	147.05	9 0 29.7	−667.2	69.23	16 25.4	60 9.9	II.		S.
13	16 8.64	2.202	11 42 43.52	142.31	+ 4 21 10.7	−720.8	68.11	16 20.0	59 50.0	II.		S.
14	17 0.75	2.146	12 38 55.37	138.96	− 0 29 30.2	−724 9	67.31	16 12.2	59 21.4	II.		S.
15	17 51.87	2.119	13 34 7.44	137.30	− 5 12 59.9	−685.9	66.93	16 3.3	58 48.8	II.		S.
16	18 42.67	2.118	14 29 0.44	137.29	− 9 33 15.9	−609.8	66.91	15 53.4	58 12.5	II.		S.
17	19 33.68	2.135	15 24 6.13	138.19	−13 16 40.3	−502.4	67.13	15 43.8	57 37.1	II.		S.
18	20 25.18	2.156	16 19 40.88	139.56	−16 11 53.9	−370.1	67.39	15 34.5	57 3.0	II.		S.
19	21 17.08	2.166	17 15 40.28	140.21	−18 10 20.0	−220.1	67.48	15 25.7	56 30.7	II.		S.
20	22 8.99	2.155	18 11 40.11	139.57	−19 6 47.5	− 62.0	67.24	15 17.4	56 0.4	II.		S.
21	23 0.29	2.115	19 7 3.07	137.12	−19 0 24.2	+ 93.0	66.58	15 9 8	55 32.3	II.		S.
22	23 50.33	2 051	20 1 10.12	133.26	−17 54 12.8	234.5	65.59	15 2.7	55 6.4	II.	N.	S.
24	0 38.64	1.973	20 53 32.56	128.53	−15 55 30.5	355.0	64.37	14 56.6	54 43.7	I.	N.	S.
25	1 25.00	1.892	21 43 58.73	123.70	−13 13 25.3	451.1	63.14	14 51.4	54 24.7	I.		S.
26	2 9.54	1 822	22 32 35.20	119.48	− 9 58 2.7	+521.8	62.07	14 47.6	54 10.9	I.		S.
27	2 52.63	1.772	23 19 43.94	116.46	− 6 19 12.6	568.6	61.32	14 45.6	54 3.6	I.		S.
28	3 34.80	1.748	0 5 58.03	115.00	− 2 26 1.2	593.9	60.99	14 45.8	54 4.1	I.		S.
29	4 16.75	1.753	0 51 58.04	115.33	+ 1 33 9.7	598.7	61.15	14 48.4	54 13.8	I.		S.
30	4 59.21	1.791	1 38 29.40	117.62	5 30 16.7	583.4	61.82	14 53.8	54 33.6	I.		S.
31	5 42.99	1.863	2 26 19.97	121.93	+ 9 16 56.3	+545.9	63.00	15 2.1	55 3.9	I.		S.
Feb. 1	6 28.87	1.966	3 16 17.08	128.13	12 43 35.4	482.5	64.63	15 13.1	55 44.6	I.		S.
2	7 17.55	2.094	4 9 2.28	135.84	15 38 51.7	388.2	66.58	15 26.7	56 34.4	I.		S.
3	8 9.47	2.233	5 5 2.48	144.21	17 49 19.2	258.0	68.61	15 42.1	57 31.1	I.		S.
4	9 4.64	2.360	6 4 18.39	151.89	19 0 24 7	+ 91.7	70.42	15 58.3	58 30.5	I.		S.
5	10 2.49	2.451	7 6 15.14	157.25	+18 58 58.9	−102.2	71.66	16 13.9	59 27.7	I.		S.
6	11 1.86	2.486	8 9 44.06	159.34	17 37 18.1	−305.6	72.10	16 27.1	60 16.1	I.	N.	S.
7	12 1.38	2.465	9 13 21.36	158.15	14 56 45.3	−492.2	71.77	16 36.4	60 50.3	I.	N.	S.
8	12 59.85	2.403	10 15 55.76	154.45	11 9 5.7	−637.6	70.90	16 40.5	61 5.6	I.		S.
9	13 56.62	2.328	11 16 48.09	149.90	6 34 9.1	−728.8	69.86	16 39.2	61 0.4	II.		S.
10	14 51.63	2.259	12 15 53.93	145.75	+ 1 35 34.2	−756.1	68.89	16 32.8	60 37.0	II.		S.
11	15 45.20	2.209	13 13 33.35	142.76	− 3 23 22.2	−730.1	68.22	16 22.5	59 59.3	II.		S.
12	16 37.84	2.181	14 10 16.96	141.09	− 8 2 21.8	−658.1	67.86	16 9.8	59 12.8	II.		S.
13	17 30.03	2.171	15 6 33.75	140.45	−12 5 7.1	−550.5	67.73	15 56.2	58 22.6	II.		S.
14	18 22.09	2.168	16 2 42.50	140.27	−15 19 25.0	−417.4	67.70	15 42.7	57 33.1	II.		S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentr'c Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Feb. 14	18 22.09	2.168	16 2 42.50	140.27	−15 19 25.0	−417.4	67.70	15 42.7	57 33.1	II. S.
15	19 14.08	2.162	16 58 46.65	139.93	−17 36 52.9	−268.0	67.58	15 30.1	56 46.9	II. S.
16	20 5.78	2.143	17 54 33.85	138.80	−18 52 52.1	−111.5	67.25	15 19.0	56 6.2	II. N. S.
17	20 56.80	2.105	18 49 45.03	136.51	−19 6 26.0	+ 42.6	66.61	15 9.5	55 31.4	II. N.
18	21 46.67	2.048	19 43 59.26	133.09	−18 20 12.0	186.1	65.69	15 2.0	55 3.5	II. N.
19	22 35.02	1.979	20 36 2.66	128.93	−16 39 50.4	+312.4	64.55	14 55.3	54 39.0	II. N.
20	23 21.65	1.907	21 26 44.45	124.56	−14 13 15.2	416.8	63.35	14 50.4	54 20.9	II. N.
22	0 6.59	1.840	22 15 44.72	120.56	−11 9 36.4	497.3	62.27	14 46.8	54 7.7	II. N. S.
23	0 50.09	1.788	23 3 18.35	117.41	− 7 38 28.7	554.2	61.44	14 44.6	53 59.6	I. S.
24	1 32.56	1.755	23 49 50.31	115.47	− 3 49 18.8	587.8	60.95	14 43.8	53 56.9	I. S.
25	2 14.54	1.747	0 35 52.77	114.98	+ 0 8 49.2	+599.2	60.87	14 44.8	54 0.6	I. S.
26	2 56.65	1.766	1 22 2.80	116.12	4 7 12.0	589.0	61.25	14 47.7	54 11.2	I. S.
27	3 39.55	1.814	2 9 0.31	118.96	7 57 9.0	556.9	62.08	14 52.8	54 29.7	I. S.
28	4 23.92	1.888	2 57 25.98	123.45	11 29 37.2	501.2	63.34	15 0.2	54 57.2	I. S.
Mar. 1	5 10.38	1.988	3 47 58.21	129.44	14 34 41.6	419.5	64.96	15 10.3	55 34.0	I. S.
2	5 59.47	2.104	4 41 7.74	136.47	+17 1 14.5	+308.2	66.77	15 22.7	56 19.8	I. S.
3	6 51 42	2.224	5 37 10.42	143.71	18 37 4.7	+165.8	68.57	15 37.3	57 13.5	I. S.
4	7 46.14	2.331	6 35 59.42	150.11	19 10 0.7	− 5.5	70.09	15 53.4	58 12.5	I. S.
5	8 43.06	2.405	7 36 59.84	154.55	18 30 6.1	−196.2	71.10	16 9.8	59 12.8	I. S.
6	9 41.24	2.435	8 39 16.63	156.24	16 32 44.1	−389.3	74.48	16 25.0	60 8.5	I. S.
7	10 39.65	2.426	9 41 47.58	155.62	+13 21 25.3	−562.2	71.28	16 37.2	60 53.2	I. S.
8	11 37.48	2.391	10 43 43.70	153.68	9 8 45.4	−692.7	70.74	16 44.7	61 20.8	I. S.
9	12 34.33	2.347	11 44 40.24	151.04	+ 4 14 58.4	−764.5	70.10	16 46.4	61 27.1	II. S.
10	13 30.17	2.308	12 44 36.33	148.74	− 0 55 24.0	−775.6	69.56	16 42.1	61 11.2	II. S.
11	14 25.23	2.282	13 43 45.77	147.17	− 5 57 26.1	−727.3	69.24	16 32.4	60 35.8	II. S.
12	15 19.79	2.266	14 42 25.24	146.19	−10 29 3.7	−625.6	69.07	16 19.0	59 46.3	II. S.
13	16 14.03	2.253	15 40 44.89	145.39	−14 13 6.6	−489.8	68.94	16 3.5	58 49.5	II. S.
14	17 7.87	2.232	16 38 40.53	144.17	−16 58 5.5	−332.6	68.67	15 47.3	57 49.9	II. S.
15	18 1.06	2.197	17 35 57.04	142.05	−18 38 8.8	−165.5	68.17	15 32.2	56 54.5	II. S.
16	18 53.18	2.143	18 32 9.42	138.81	−19 12 26.2	− 5.5	67.35	15 18.7	56 4.9	II. S.
17	19 43.81	2.074	19 26 52.42	134.64	−18 44 11.8	+144.3	66.27	15 7.3	55 23.2	II. S.
18	20 32.67	1.996	20 19 48.08	130.01	−17 19 34.2	275.6	65.00	14 58.4	54 50.3	II. S.
19	21 19.63	1.918	21 10 50.28	125.09	−15 6 29.4	386.1	63.71	14 51.6	54 25.6	II. S.
20	22 4.82	1.849	22 0 5.63	121.03	−12 13 44.8	473.8	62.55	14 47.1	54 8.9	II. S.
21	22 48.52	1.796	22 47 51.60	117.89	− 8 50 23.9	539.1	61.63	14 44.4	53 59.2	II. S.
22	23 31.17	1.762	23 34 33.67	115.83	− 5 5 28.4	+581.7	61.04	14 43.5	53 55.8	II. S.
24	0 13.26	1.750	0 20 42.66	115.14	− 1 7 56.2	602.1	60.84	14 44.2	53 58.2	I. S.
25	0 55.36	1.763	1 6 52.41	115.91	+ 2 53 14.2	600.0	61.06	14 46.3	54 5.9	I. S.
26	1 38.07	1.800	1 53 38.15	118.15	6 48 54.1	574.4	61.71	14 49.9	54 19.2	I. S.
27	2 21.94	1.860	2 41 34.54	121.78	10 29 33.2	524.7	62.74	14 55.1	54 38.3	I. S.
28	3 7.52	1.941	3 31 13.27	126.62	+13 45 8.5	+448.8	64.08	15 2.0	55 3.8	I. S.
29	3 55.22	2.035	4 22 59.38	132.31	16 25 3.0	346.1	65.63	15 10.8	55 36.1	I. S.
30	4 45.25	2.134	5 17 6.49	138.26	18 18 18.3	215.7	67.19	15 21.5	56 15.3	I. S.
31	5 37.59	2.225	6 13 31.86	143.70	19 14 16.4	+ 60.2	68.58	15 34.0	57 1.3	I. N.
32	6 31.87	2.294	7 11 54.07	147.89	+19 3 59.7	−114.1	69.61	15 48.0	57 52.6	I. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Apr. 1	6 31.87	2.294	7 11 54.07	147.89	+19 3 59.7	-114.1	69.61	15 48.0	57 52.6	I. N.
2	7 27.48	2.335	8 11 36.35	150.33	17 41 58.6	-296.2	70.18	16 2.7	58 46.5	I.
3	8 23.72	2.347	9 11 56.24	151.08	15 8 5.6	-470 7	70.31	16 17.1	59 39.3	I.
4	9 19.99	2.340	10 12 18.22	150.63	11 28 50.4	-617.9	70.14	16 29.6	60 25.5	I.
5	10 15.97	2.326	11 12 23.01	149.77	6 57 36.1	-727.9	69.87	16 38.8	60 59.3	I.
6	11 11.65	2.316	12 12 9.60	149.19	+ 1 53 49.2	-781.0	69.69	16 43.2	61 15.5	I. N.
7	12 7.21	2.316	13 11 48.95	149.21	- 3 19 3.4	-772.9	69.68	16 42.0	61 11.1	II. N. S.
8	13 2.90	2.325	14 11 35 98	149.75	- 8 16 21.2	-704.0	69.84	16 35.2	60 46.1	II. N. S.
9	13 58.82	2.333	15 11 36.76	150 25	-12 35 20.4	-583.9	69.96	16 23.7	60 3.8	II. S.
10	14 54.80	2.326	16 11 41.40	149.94	-15 58 6.4	-425.9	69.99	16 9.0	59 9.8	II. S.
11	15 50.38	2.298	17 11 22.03	148.16	-18 13 29.2	-249.6	69.63	15 52.8	58 10.2	II. S.
12	16 44.90	2.240	18 9 58.85	144.61	-19 17 33.6	- 71.8	68.82	15 36.6	57 10.9	II. N. S.
13	17 37.70	2.157	19 6 52.06	139.61	-19 12 44.9	+ 93.0	67.60	15 21.8	56 16.4	II. N.
14	18 28.32	2.060	20 1 33.59	133.80	-18 5 56.4	237.1	66.13	15 9.1	55 29.8	II. N.
15	19 16.57	1.962	20 53 53.44	127.94	-16 6 20.3	356.6	64.60	14 59.0	54 52.8	II. N.
16	20 2.61	1.876	21 43 59.75	122.76	-13 23 48.0	+451.8	63.19	14 51.7	54 25.7	II. N.
17	20 46.79	1.809	22 32 14.68	119.27	-10 7 53.1	523.9	62.05	14 47.0	54 8.7	II. N.
18	21 29.65	1.766	23 19 9.62	116.11	- 6 27 34.0	574.2	61.28	14 44.9	54 0.7	II. N.
19	22 11.77	1.749	0 5 20.53	115 06	- 2 31 25.7	602.9	60.94	14 44.9	54 0.9	II. N.
20	22 53.80	1.758	0 51 25.56	115.63	+ 1 31 59.6	610.1	61.04	14 46.9	54 8.1	II. N.
21	23 36.36	1.793	1 38 2.79	117.73	+ 5 33 46.9	+594.5	61.59	14 50.4	54 21.1	II. N.
23	0 20.05	1.852	2 25 48.10	121.26	9 24 18.8	553.6	62.54	14 55.3	54 39.1	I. N.
24	1 5.40	1.930	3 15 12.65	125.95	12 53 6.4	485.5	63.80	15 1.3	55 1.2	I. N. S.
25	1 52.77	2.019	4 6 39.16	131.33	15 48 54.0	388.7	65.24	15 8.5	55 27.4	I. N. S.
26	2 42.32	2.109	5 0 17.13	137.08	18 0 12.2	263.3	66.69	15 16.6	55 57.3	I. N. S.
27	3 33.93	2.188	5 55 58.89	141.51	+19 16 13.5	+113.0	67.95	15 25.7	56 30.8	I. N.
28	4 27.17	2.244	6 53 18.90	144.87	19 28 16.7	- 54.9	68.83	15 35.8	57 7.9	I. N.
29	5 21.42	2.271	7 51 38.78	146.49	18 31 19.0	-230.1	69.27	15 46.8	57 48.1	I. N.
30	6 15.98	2.272	8 50 18.02	146.56	16 25 1.6	-399.2	69.30	15 58.2	58 29.9	I. N.
May 1	7 10.36	2.258	9 48 46.28	145.71	13 14 22.6	-549.5	69.06	16 9.4	59 11.1	I. N.
2	8 4.36	2.243	10 46 51.61	144.78	+ 9 9 24.4	-668.9	68.80	16 19.6	59 48.5	I. N.
3	8 58.09	2.238	11 44 40.99	144.51	+ 4 24 44.1	-746.5	68.68	16 27.6	60 17.9	I. N.
4	9 51.93	2.252	12 42 36.48	145.31	- 0 41 7.7	-773.8	68.82	16 32.2	60 35.1	I. N.
5	10 46.30	2.283	13 41 4.68	147.18	- 5 46 45.0	-744.8	69.24	16 32.7	60 36.9	I. N.
6	11 41.57	2.323	14 40 26.02	149.62	-10 29 23.4	-659.1	69.81	16 28.6	60 21.7	I. N.
7	12 37.76	2.357	15 40 43.33	151 67	-14 27 29.1	-523.7	70.32	16 20.1	59 50.4	II. N.
8	13 34.50	2.366	16 41 33.86	152.21	-17 23 40.3	-352.4	70.48	16 8.0	59 6.0	II. N.
9	14 31.02	2.336	17 42 10.38	150.41	-19 7 28.9	-165.3	70.11	15 53.7	58 13.6	II. N.
10	15 26.30	2.265	18 41 34.32	146.12	-19 36 33.8	+ 18.0	69.13	15 38.7	57 18.4	II. N.
11	16 19.49	2.163	19 38 47.62	140.01	-18 55 46.6	182.1	67.67	15 24.3	56 25.5	II. N.
12	17 10.04	2.049	20 33 27.76	133.14	-17 14 42.2	+318.6	65.98	15 11.5	55 38.6	II. N.
13	17 57.89	1.940	21 25 22.82	126.57	-14 44 46.1	426.3	64.30	15 1.1	55 0.4	II. N.
14	18 43.31	1.850	22 14 52.49	121.13	-11 37 13.7	507.2	62.85	14 53.4	54 32.2	II. N.
15	19 26.87	1.786	23 2 29.63	117.26	- 8 2 13.1	564.2	61.78	14 48.7	54 14.9	II. N.
16	20 9.26	1.751	23 48 55.28	115.20	- 4 8 41.7	+600.0	61.18	14 46.9	54 8.1	II. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
May 16	20 9.26	1.751	23 48 55.28	115.20	− 4 8 41.7	+600.0	61.18	14 46.9	54 8.1	II. N.
17	20 51.16	1.747	0 34 54.05	115.01	− 0 4 55.2	615.4	61.07	14 47.7	54 11.1	II. N.
18	21 33.38	1.776	1 21 10.91	116.70	+ 4 0 52.1	609.7	61.46	14 50.8	54 22.6	II. N.
19	22 16.63	1.833	2 8 29.12	119.96	7 59 45.9	580.5	62.32	14 55.9	54 41.3	II. N.
20	23 1.53	1.913	2 57 27.25	124 96	11 41 41.5	524.3	63.57	15 2.5	55 5.6	II. N.
21	23 48.59	2 010	3 48 34.91	130.79	+14 55 11.3	+437.9	65.07	15 10.2	55 33.6	II. N.
23	0 38.04	2.111	4 42 6.91	136.84	17 27 47.8	319.7	66.62	15 18.4	56 3.8	I. N.
24	1 29.80	2.198	5 37 57.18	142.14	19 7 10.4	172.5	67.98	15 26.9	56 35.1	I. N.
25	2 23.35	2.258	6 35 35.97	145.75	19 42 56.5	+ 3.4	68.93	15 35.4	57 6.5	I. N.
26	3 17.91	2.281	7 34 14.93	147.08	19 8 47.8	−174.4	69.32	15 43.8	57 37.1	I. N.
27	4 12.58	2.269	8 33 0.45	146.38	+17 24 0.8	−346.9	69.20	15 51.9	58 6.8	I. N.
28	5 6.65	2.235	9 31 10.32	144.31	14 33 43.7	−500.1	68.73	15 59.5	58 34.8	I. N.
29	5 59.81	2.196	10 28 25.33	141.99	10 47 59.6	−622.9	68.18	16 6.5	59 0.4	I. N.
30	6 52.16	2.170	11 24 51.55	140.39	6 20 24.8	−708.2	67.77	16 12.4	59 22.4	I. N.
31	7 44.14	2.166	12 20 55.12	140.14	+ 1 27 4.8	−751.0	67.68	16 16.9	59 38.7	I. N.
June 1	8 36.35	2.189	13 17 12.91	141.57	− 3 34 3.2	−746.7	67.98	16 19.3	59 47.5	I. N.
2	9 29.40	2.236	14 14 21.70	144.35	− 8 23 35.8	−693.4	68.64	16 18.9	59 46.2	I. N.
3	10 23.73	2.292	15 12 46.53	147.74	−12 41 34.9	−589.2	69.40	16 15.5	59 33.7	I. N.
4	11 19.34	2.339	16 12 29.02	150.60	−16 9 10.8	−442.5	70.06	16 8.9	59 9.5	I. N.
5	12 15.77	2.355	17 13 0.29	151.60	−18 31 21.9	−265.1	70.30	15 59.6	58 35.1	II. N.
6	13 12.06	2.326	18 13 23.88	149.86	−19 39 36.6	− 76.1	69.90	15 48.0	57 52.6	II. N.
7	14 7.10	2.252	19 12 31.54	145.35	−19 33 20.6	+104.4	68.85	15 35.5	57 6.6	II. N.
8	14 59.91	2.145	20 9 25.30	138.91	−18 19 9.8	261.6	67.31	15 22.9	56 20.5	II. N.
9	15 49.96	2.027	21 3 33.59	131.78	−16 8 9.5	388.0	65.58	15 11.4	55 38.2	II. N.
10	16 37.25	1.917	21 54 54.84	125.15	−13 12 55.4	483.1	63.90	15 1.7	55 2.7	II. N.
11	17 22.13	1.828	22 43 51.62	119.85	− 9 45 24.9	+550.0	62.52	14 54.5	54 36.1	II. N.
12	18 5.25	1.770	23 31 1.86	116.33	− 5 56 4.5	592.9	61.58	14 50.0	54 19.6	II. N.
13	18 47.34	1.744	0 17 11.37	114.82	− 1 53 52.2	614.8	61.16	14 48.5	54 14.2	II. N.
14	19 29.25	1.754	1 3 9.45	115.38	+ 2 13 5.6	615.3	61.28	14 50.0	54 19.6	II. N.
15	20 11.79	1.797	1 49 45.66	117.98	6 16 43.3	597.8	61.94	14 54.3	54 35.4	II. N.
16	20 55.76	1.872	2 37 47.32	122.45	+10 8 6.0	+554.9	63.08	15 0.8	54 59.1	II. N.
17	21 41.83	1.971	3 27 55.76	128.45	13 36 48.9	483.7	64.59	15 9.2	55 30.2	II. N.
18	22 30.49	2.075	4 20 40.21	135.31	16 30 41.9	380.1	66.30	15 19.0	56 6.0	II. N.
19	23 21.90	2.196	5 16 9.51	142.01	18 36 24.9	242.9	67.94	15 29.3	56 43.8	II. N.
21	0 15.73	2.284	6 14 4.64	147.25	19 41 8.4	+ 76.7	69.23	15 39.4	57 20.9	I. N.
22	1 11.18	2.329	7 13 37.44	150.00	+19 35 14.0	−107.6	69.92	15 48.6	57 54.9	I. N.
23	2 7.16	2.327	8 13 41.76	149.90	18 15 52.6	−292.1	69.95	15 56.5	58 23.8	I. N.
24	3 2.60	2.288	9 13 14.05	147.49	15 43 59.7	−458.4	69.41	16 2.7	58 46.7	I. N.
25	3 56.82	2.230	10 11 32.90	144.01	12 12 29.9	−592.7	68.61	16 7.2	59 3.1	I. N.
26	4 49.66	2.176	11 8 28.20	140.73	7 55 13.7	−686.4	67.84	16 10.0	59 13.4	I. N.
27	5 41.40	2.141	12 4 17.69	138.66	+ 3 9 8.8	−736.5	67.34	16 12.2	59 18.0	I. N.
28	6 32.65	2.135	12 59 37.44	138.28	− 1 48 3.5	−742.1	67.25	16 11.0	59 17.1	I. N.
29	7 24.11	2.158	13 55 10.26	140.21	− 6 38 36.5	−703.2	67.58	16 9.3	59 10.9	I. N.
30	8 16.43	2.205	14 51 34.63	142.48	−11 3 2.8	−620.9	68.22	16 6.1	58 59.1	I. N.
31	9 9.99	2.258	15 49 13.42	145.73	−14 49 47.3	−497.6	68.97	16 1.2	58 41.2	I. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
July 1	9 9.99	2.258	15 49 13.42	145.73	−14 49 47.3	−497.6	68.97	16 1.2	58 41.2	I. N.
2	10 4.76	2.300	16 48 4.[illegible]7	148.25	−17 38 10.4	−340.9	69.53	15 54.7	58 17.2	I. N.
3	11 0.15	2.310	17 47 34.37	148.85	−19 19 10.7	−162.0	69.64	15 46.6	57 47.6	I. N.
4	11 55.27	2.275	18 46 47.23	146.72	−19 47 14.4	+ 20.7	69.11	15 37.3	57 13.3	I. N.
5	12 49.03	2.198	19 44 38.56	142.16	−19 4 19.4	190.3	67.98	15 27.2	56 36.3	II. N.
6	13 40.59	2.095	20 40 17.23	135.89	−17 18 22.8	+334.4	66.45	15 17.1	55 59.0	II. N.
7	14 29.54	1.984	21 33 18.17	129.22	−14 41 3.9	446.9	64.78	15 7.6	55 24.3	II. N.
8	15 15.90	1.883	22 23 44.28	123.15	−11 25 5.4	526.0	63.27	14 59.5	54 54.5	II. N.
9	16 0.10	1.805	23 12 0.17	118.45	− 7 42 25.1	581.0	62.07	14 53.3	54 31.7	II. N.
10	16 42.78	1.757	23 58 44.39	115 56	− 3 43 27.9	610.0	61.34	14 49.6	54 18.0	II. N.
11	17 24.70	1.742	0 44 43.31	114.68	+ 0 22 47.1	+617.9	61.13	14 48.6	54 14.4	II. N.
12	18 6.69	1.762	1 30 45.71	115.90	4 28 14 2	605.9	61.47	14 50.6	54 21.6	II. N.
13	18 49.57	1.817	2 17 42.57	119.19	8 24 44.6	573.0	62.34	14 55.5	54 39.7	II. N.
14	19 34.16	1.904	3 6 21.86	124.39	12 3 20.9	515.8	63.69	15 3.1	55 7.8	II. N.
15	20 21.15	2.016	3 57 25.39	131.10	15 13 30.5	429.8	65.39	15 13.2	55 44.8	II. N.
16	21 11.00	2.140	4 51 21.09	138.58	+17 42 51.1	+311.2	67.23	15 25.0	56 28.2	II. N.
17	22 3.79	2.256	5 48 13.56	145.61	19 17 54.0	+158.7	68.91	15 37.7	57 14.8	II. N.
18	22 59.06	2.343	6 47 35.75	150.82	19 46 5.1	− 21.5	70.14	15 50.3	58 1.0	II. N.
19	23 55.87	2.381	7 48 29.84	153.15	18 58 56.1	−214.8	70.68	16 1.6	58 42.6	II. N.
21	0 52.97	2.368	8 49 37.73	152.39	16 55 11.9	−400.7	70.50	16 10.7	59 16.0	I. N.
22	1 49.27	2.319	9 50 6.39	149.37	+13 42 7.5	−558.4	69.81	16 16.8	59 38.4	I. N.
23	2 44.16	2.255	10 49 4.94	145.47	9 34 10.5	−672.8	68.91	16 19.7	59 48.9	I. N.
24	3 37.54	2.197	11 46 33.00	142.02	+ 4 50 6.5	−738.6	68.13	16 19.7	59 48.0	I. N.
25	4 29.79	2.162	12 42 52.76	139.89	− 0 9 56.8	−753.3	67.62	16 16.5	59 37.3	I. N.
26	5 21.51	2.154	13 38 41.34	139.43	− 5 6 35.7	−721.8	67.54	16 11.6	59 19.2	I. N.
27	6 13.38	2.172	14 34 38.39	140.51	− 9 41 44.7	−647.0	67.83	16 5.2	58 55.8	I. N.
28	7 5.90	2.207	15 31 15.08	142.61	−13 39 14.6	−534.6	68.31	15 58.0	58 29.2	I. N.
29	7 59.31	2.242	16 28 44.48	144.75	−16 45 7.4	−390.3	68.81	15 50.1	58 0.5	I. N.
30	8 53.39	2.258	17 26 55.23	145.88	−18 48 32.0	−223.9	69.02	15 41.9	57 30.3	I. N.
31	9 47.58	2.244	18 25 11.68	145.10	−19 43 1.4	− 48.1	68 77	15 33.5	56 59.5	I. N.
Aug. 1	10 41.01	2.198	19 22 43.03	142.14	−19 27 40.9	+122.8	67.99	15 25.0	56 28.3	I. N. S.
2	11 32.86	2.118	20 18 39.10	137.30	−18 7 11.4	275.7	66.75	15 16.6	55 57.3	I. N. S.
3	12 22.55	2.021	21 12 25.06	131.45	−15 50 42.9	401.8	65.26	15 8.5	55 27.6	II. N. S.
4	13 9.87	1.924	22 3 48.90	125.61	−12 49 51.4	497.4	63.77	15 1.1	55 0.5	II. N.
5	13 55.00	1.840	22 53 0.58	120.55	− 9 16 45.0	563.4	62.47	14 54.9	54 37.4	II. N.
6	14 38.37	1.779	23 40 26.64	116.87	− 5 22 48.6	+602.2	61.54	14 50.1	54 20.0	II. N.
7	15 20.61	1.746	0 26 44.24	114.88	− 1 18 10.5	617.4	61.06	14 47.4	54 10 0	II. N.
8	16 2.42	1.744	1 12 36.50	114.78	+ 2 48 9.9	611.0	61.09	14 47.0	54 8.6	II. N.
9	16 44.58	1.775	1 58 49.57	116.63	6 47 54.0	584.3	61.65	14 49.5	54 17.6	II. N.
10	17 27.86	1.838	2 46 11.22	120.38	10 32 41.1	535.8	62.69	14 54.6	54 36.3	II. N.
11	18 13.01	1.930	3 35 22.75	125.91	+13 53 25.0	+463.4	64.16	15 2.6	55 6.0	II. N.
12	19 0.65	2.043	4 27 4.77	132.75	16 39 36.9	361.7	65.90	15 13.4	55 45.6	II. N.
13	19 51.13	2.165	5 21 39.44	140.14	18 38 57.7	230.6	67.73	15 26.5	56 33.8	II. N.
14	20 44.50	2.278	6 19 6.62	146.92	19 39 57.2	+ 67.5	69.35	15 41.1	57 27.4	II. N. S.
15	21 40.23	2.359	7 18 56.54	151.83	+19 30 16.1	−119.0	70.47	15 56.1	58 22.5	II. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Aug. 16	22 37.40	2.396	8 20 12.53	154.01	+18 3 37.8	-314.4	70.94	16 10.2	59 14.3	II. S.
17	23 34.87	2.386	9 21 46.61	153.42	15 20 56.9	-495.5	70.77	16 21.8	59 56.9	II. N. S.
19	0 31.68	2.345	10 22 41.36	150.92	11 31 56.3	-642.4	70.17	16 29.8	60 26.1	I. N.
20	1 27.33	2.293	11 22 25.91	147.79	6 53 52.0	-738 8	69.43	16 33.2	60 38.6	I. N.
21	2 21.78	2.248	12 20 58.92	145.11	+ 1 48 32.6	-778.2	68.83	16 31.9	60 33.9	I. N.
22	3 15.40	2.223	13 18 40.81	143.59	- 3 21 3.5	-760.7	68.51	16 26.5	60 14.2	I. N.
23	4 8.65	2.218	14 16 1.43	143.32	- 8 13 20.4	-692.8	68.50	16 18.0	59 42.4	I. N.
24	5 2.01	2.230	15 13 28.19	144.01	-12 29 37.6	-582.4	68.72	16 7.5	59 4.3	I. N.
25	5 55.72	2.245	16 11 15.85	144.67	-15 54 55.7	-439.6	68.97	15 56.2	58 22.6	I. N.
26	6 49.70	2.250	17 9 20.29	144.89	-18 18 24.6	-275.2	69.02	15 44.8	57 40.8	I. N.
27	7 43.56	2.233	18 7 17.40	144.22	-19 33 52.5	-101.5	68.72	15 33.9	57 0.7	I. N. S.
28	8 36.67	2.188	19 4 29.36	141.48	-19 40 6.9	+ 68.8	67.98	15 23.9	56 24.1	I. S.
29	9 28.37	2.117	20 0 16.05	137.17	-18 40 44.3	224.9	66.84	15 14.9	55 51.1	I. S.
30	10 18.14	2.030	20 54 7.02	131.98	-16 43 19.6	358.0	65.44	15 7.0	55 21.9	I. S.
31	11 5.76	1.940	21 45 48.53	126.55	-13 58 0.0	463.9	64.00	15 0.1	54 56.5	I. S.
Sept. 1	11 51.31	1.859	22 35 25.79	121.67	-10 36 0.0	+541.4	62.70	14 54.2	54 35.2	I. S.
2	12 35.11	1.795	23 23 17.67	117.86	- 6 48 34.1	591.5	61.69	14 49.7	54 18.4	II. N.
3	13 17.66	1.755	0 9 54.10	115.44	- 2 46 17.2	616.0	61.06	14 46.4	54 6.5	II. N.
4	13 59.55	1.741	0 55 51.12	114.60	+ 1 21 5.1	617.2	60.89	14 44.9	54 0.9	II. N.
5	14 41.45	1.755	1 41 48.12	115.44	5 24 30.1	596.3	61.18	14 45.2	54 2.1	II. N.
6	15 24.02	1.797	2 28 25.59	117.96	+ 9 15 15.7	+553.8	61.95	14 47.8	54 11.6	II. N.
7	16 7.91	1.865	3 16 23.13	122.09	12 44 33.9	488.8	63.10	14 52.9	54 30.3	II. N.
8	16 53.73	1.957	4 6 16.54	127.55	15 43 0.6	399.2	64.59	15 0.1	54 59.0	II. N.
9	17 41.93	2.062	4 58 33.03	133.90	18 0 20.6	282.8	66.25	15 11.2	55 37.6	II. N.
10	18 32.72	2.169	5 53 25.26	140.39	19 25 36.9	+139.0	67.88	15 24.3	56 25.4	II. N.
11	19 25.96	2.264	6 50 45.32	146.06	+19 48 7.3	- 30.0	69.25	15 39.3	57 20.6	II. S.
12	20 21.17	2.330	7 50 2.88	150.05	18 59 18.9	-215.5	70.17	15 55.5	58 20.1	II. S.
13	21 17.53	2.361	8 50 30.89	151.92	16 55 16.0	-403.1	70.55	16 11.5	59 19.0	II. S.
14	22 14.25	2.360	9 51 19.42	151.86	13 39 1.5	-573.1	70.48	16 25.8	60 11.5	II. S.
15	23 10.67	2.340	10 51 50.94	150.66	9 21 38.1	-705.9	70.15	16 36.6	60 51.0	II. S.
17	0 6.55	2.317	11 51 49.43	149.26	+ 4 21 25.6	-785.3	69.80	16 42.5	61 12.7	I. N. S.
18	1 1.96	2.303	12 51 19.54	148.39	- 0 58 16.9	-802.6	69.61	16 42.7	61 13.6	I. N. S.
19	1 57.18	2.302	13 50 38.25	148.31	- 6 12 19.8	-757.5	69.64	16 37.4	60 54.0	I. S.
20	2 52.50	2.310	14 50 3.23	148.83	-10 56 55.8	-657.1	69.84	16 27.7	60 18.3	I. S.
21	3 48.05	2.318	15 49 41.81	149.32	-14 52 13.6	-513.4	70.01	16 14.6	59 30.3	I. N.
22	4 43.66	2.312	16 49 23.85	148.97	-17 44 1.9	-342.2	69.98	16 0.1	58 37.1	I. N.
23	5 38.85	2.282	17 48 41.10	147.17	-19 24 35.9	-160.0	69.56	15 45.5	57 43.3	I. N.
24	6 32.98	2.223	18 46 54.22	143.64	-19 52 32.7	+ 18.5	68.68	15 31.7	56 52.9	I. S.
25	7 25.39	2.141	19 43 24.22	138.68	-19 11 53.8	181.4	67.41	15 19.5	56 8.1	I. S.
26	8 15.65	2.046	20 37 44.54	132.96	-17 30 38.1	320.7	65.90	15 9.1	55 29.9	I. S.
27	9 3.60	1.951	21 29 46.18	127.24	-14 58 47.9	+433.8	64.36	15 0.7	54 58.9	I. S.
28	9 49.39	1.867	22 19 37.22	122.18	-11 47 15.4	519.5	62.95	14 54.1	54 34.6	I. S.
29	10 33.36	1.801	23 7 39.36	118.22	- 8 6 45.1	578.8	61.85	14 49.2	54 16.8	I. S.
30	11 16.02	1.758	23 54 22.78	115.66	- 4 7 33.6	612.3	61.12	14 45.9	54 4.6	I. S.
31	11 57.96	1.740	0 40 22.27	114.57	+ 0 0 34.4	+623.6	60.81	14 44.1	53 58.0	II. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Oct. 1	11 57.96	1.740	0 40 22.27	114.57	+ 0 0 34.4	+623.6	60.81	14 44.1	53 58.0	II. S.
2	12 39.77	1.748	1 26 14.59	115.04	4 8 16.4	611.1	60.97	14 43.8	53 56.9	II. N.
3	13 22.08	1.781	2 12 36.32	116.99	8 6 19.6	575.4	61.54	14 45.1	54 1.7	II. N.
4	14 5.44	1.836	3 0 2.12	120.35	11 45 27.5	516.3	62.50	14 48.2	54 13.0	II. N.
5	14 50.38	1.911	3 49 2.34	124.83	14 56 7.9	433.0	63.76	14 53.1	54 31.0	II. N.
6	15 37.27	1.998	4 39 59.80	130.04	+17 28 30.5	+325.1	65.19	15 0.2	54 57.0	II. N.
7	16 26.29	2.087	5 33 5.77	135.43	19 12 38.4	191.8	66.63	15 9.6	55 31.4	II. N.
8	17 17.39	2.169	6 28 16.51	140.33	19 59 5.2	+ 36.6	67.89	15 21.2	56 14.2	II. N. S.
9	18 10.23	2.231	7 25 12.27	144.10	19 40 1.5	−134.3	68.84	15 34.9	57 4.7	II. N S.
10	19 4.29	2.269	8 23 21.40	146.42	18 10 39.0	−312.2	69.40	15 50.5	58 1.7	II. S.
11	19 59.00	2.286	9 22 9.51	147.40	+15 30 50.8	−484.3	69.59	16 6.2	58 59.6	II. S.
12	20 53.92	2.289	10 21 10.27	147.58	11 46 6.6	−634.3	69.57	16 21.4	59 55.4	II. S.
13	21 48.87	2.291	11 20 12.87	147.67	7 8 19.5	−746.8	69.52	16 33.9	60 41.2	II. S.
14	22 43.95	2.302	12 19 23.34	148.33	+ 1 55 39.4	−807.6	69.65	16 42.9	61 14.1	II. S.
15	23 39.45	2.326	13 18 59.07	149.79	− 3 29 25.9	−806.0	69.99	16 46.1	61 26.1	II. S.
17	0 35.69	2.361	14 19 18.73	151.90	− 8 40 43.7	−739.7	70.52	16 43.4	61 15.9	I. S.
18	1 32.77	2.396	15 20 29.79	153.91	−13 13 9.5	−613.5	71.05	16 34.9	60 45.0	I. N. S.
19	2 30.47	2.409	16 22 17.97	154.80	−16 45 37.0	−442.7	71.32	16 22.1	59 58.0	I. N. S.
20	3 28.13	2.389	17 24 2.65	153.59	−19 4 12.0	−248.1	71.09	16 6.6	59 1.1	I. N. S.
21	4 24.81	2.327	18 24 49.99	149.87	−20 3 47.7	− 51.4	70.25	15 50.3	58 0.9	I. S.
22	5 19.55	2.230	19 23 36.68	144.03	−19 47 26.1	+129.5	68.85	15 34.4	57 2.6	I. S.
23	6 11.71	2.115	20 19 46.56	137.04	−18 23 56.8	283.1	67.11	15 20.1	56 10.3	I. S.
24	7 1.05	1.997	21 13 13.57	130.03	−16 5 0.4	406.4	65.28	15 8.2	55 26.3	I. S.
25	7 47.69	1.894	22 4 2.37	123.81	−13 2 47.0	499 9	63.61	14 58.7	54 51.4	I. S.
26	8 32.13	1.814	22 52 32.90	118.96	− 9 28 39.3	566.4	62.26	14 51.7	54 25.9	I. S.
27	9 14.97	1.761	23 39 26.30	115.80	− 5 32 52.7	+608.2	61.32	14 47.2	54 9.2	I. S.
28	9 56.88	1.736	0 25 24.80	114.33	− 1 24 55.3	627.6	60.87	14 44.7	54 0.2	I. S.
29	10 38.55	1.740	1 11 8.19	114.56	+ 2 46 15.8	624.4	60.89	14 44.2	53 58.2	I. S.
30	11 20.63	1.771	1 57 16.72	116.40	6 51 37.0	598.2	61.36	14 45.3	54 2.2	I. S.
31	12 3.74	1.825	2 44 26.52	119.63	10 41 40.1	547.8	62.21	14 47.8	54 11.6	II. S.
Nov. 1	12 48.36	1.896	3 33 7.71	123.95	+14 6 24.8	+471.5	63.41	14 51.8	54 26.2	II. N. S.
2	13 34.84	1.978	4 23 40.95	128.77	16 55 23.1	368.5	64.75	14 57.1	54 45.6	II. N. S.
3	14 23.31	2.060	5 16 13.68	133.79	18 58 9.9	241.0	66.08	15 3.8	55 10.3	II. N. S.
4	15 13.62	2.130	6 10 37.19	137.99	20 5 13.8	+ 91.3	67.22	15 12.0	55 40.6	II. N.
5	16 5.37	2.178	7 6 27.25	140.93	20 9 6.7	− 73.5	68.02	15 21.8	56 16.4	II. S.
6	16 58.00	2.203	8 3 9.96	142.38	+19 5 33.9	−244.1	68.43	15 33.1	56 58.0	II. S.
7	17 50.94	2.206	9 0 11.72	142.60	16 54 24.5	−409.8	68.50	15 45.8	57 44.4	II. S.
8	18 43.83	2.200	9 57 10.10	142.23	13 39 51.8	−559.2	68.40	15 59.1	58 33.5	II. S.
9	19 36.58	2.197	10 54 0.45	142.04	9 30 33.0	−681.8	68.33	16 12.5	59 22.5	II. S.
10	20 29.43	2.210	11 50 56.95	142.83	+ 4 39 23.4	−766.8	68.46	16 24.5	60 6.7	II. S.
11	21 22.85	2.246	12 48 27.77	144.97	− 0 36 23.1	−803.2	68.93	16 33.9	60 41.2	II. S.
12	22 17.41	2.304	13 47 6.33	148.43	− 5 55 29.1	−782 1	69.73	16 39.2	61 0.6	II. S.
13	23 13.52	2.373	14 47 18.82	152.66	−10 53 37.9	−698.3	70.72	16 39.3	61 1.2	II. S.
15	0 11.28	2.436	15 49 10.27	156.42	−15 6 5.9	−555.2	71.63	16 34.1	60 42.1	I. S.
16	1 10.20	2.465	16 52 11.69	158.23	−18 11 40.1	−367.1	72.09	16 24.0	60 4.8	I. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.	
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″		
Nov. 17	2 9.22	2.442	17 55 19.60	156.82	−19 56 49.9	−157.6	71.81	16 10.3	59 14.6	I.	S.
18	3 6.99	2.362	18 57 11.86	152.00	−20 18 21.0	+ 47.0	70.72	15 54.6	58 16.9	I.	S.
19	4 2.29	2.240	19 56 35.17	144.65	−19 22 32.9	226.4	68.99	15 38.6	57 18.0	I.	S.
20	4 54.40	2.102	20 52 47.04	136.31	−17 21 52 9	370.7	66.95	15 23.3	56 22.0	I.	S.
21	5 43.23	1.971	21 45 41.40	128.39	−14 30 51.8	478.7	64.94	15 10.5	55 35.0	I.	S.
22	6 29.16	1.862	22 35 40.89	121.84	−11 3 14.7	+554.6	63.21	15 0.1	54 56.6	I.	S.
23	7 12.83	1.784	23 23 25.29	117.19	− 7 10 53.0	603.1	61.92	14 52.5	54 28.8	I.	S.
24	7 55.05	1.740	0 9 41.99	114.56	− 3 3 45.7	628.7	61.15	14 47.8	54 11.4	I.	S.
25	8 36.64	1.730	0 55 20.29	113.97	+ 1 9 20.0	633.2	60.93	14 45.7	54 4.0	I.	S.
26	9 18.37	1.753	1 41 8.08	115.30	5 19 59.4	616.5	61.24	14 46.2	54 5.6	I.	S.
27	10 1.01	1.804	2 27 49.61	118.40	+ 9 19 26.1	+576.7	62.01	14 48.7	54 14.7	I.	S.
28	10 45.16	1.879	3 16 2.89	122.89	12 57 59.9	511.5	63.17	14 52.9	54 30.3	I.	S.
29	11 31.31	1.968	4 6 15.81	128.27	16 4 57.4	418.4	64.56	14 58.5	54 50.8	I.	S.
30	12 19.65	2.060	4 58 40.91	133.76	18 28 55.9	296.8	65.98	15 5.0	55 14.7	II.	S.
Dec. 1	13 10.07	2.138	5 53 10.48	138.45	19 58 55.8	+149.5	67.20	15 12.3	55 41.5	II.	S.
2	14 2.07	2.189	6 49 15.48	141.60	+20 25 55.6	− 16.3	68.03	15 20.2	56 10.4	II.	S.
3	14 54.91	2.207	7 46 11.28	142.70	19 44 52.5	−189.3	68.38	15 28.6	56 41.2	II.	S.
4	15 47.81	2.196	8 43 10.72	142.00	17 55 18.8	−356.6	68.27	15 37.4	57 13.7	II.	S.
5	16 40.20	2.168	9 39 38.92	140.26	15 1 59.2	−506.4	67.89	15 46.7	57 47.6	II.	S.
6	17 31.85	2.138	10 35 23.18	138.50	11 13 46.1	−629.8	67.48	15 56.1	58 22.2	II.	S.
7	18 22.96	2.125	11 30 35.05	137.70	+ 6 42 40.1	−719.8	67.28	16 5.4	58 56.4	II.	S.
8	19 14.06	2.138	12 25 45.77	138.50	+ 1 43 12.8	−770.4	67.45	16 13.9	59 27.8	II.	S.
9	20 5.85	2.183	13 21 38.22	141.20	− 3 27 39.0	−775.7	68.08	16 20.9	59 53.6	II.	S.
10	20 59.07	2.256	14 18 56.59	145.58	− 8 30 26.9	−729.1	69.12	16 25.5	60 10.2	II.	S.
11	21 54.25	2.343	15 18 13.28	150.85	−13 3 33.6	−627.0	70.34	16 26.5	60 14.2	II.	S.
12	22 51.49	2.423	16 19 33.80	155.61	−16 45 4.7	−472.0	71.44	16 23.7	60 3.6	II.	S.
13	23 50.23	2.463	17 22 23.98	158.05	−19 15 47.1	−277.0	72.00	16 16.7	59 38.2	II.	S.
15	0 49.23	2.442	18 25 30.16	156.79	−20 24 15.7	− 64.9	71.72	16 6.3	58 59.9	I.	S.
16	1 46.95	2.358	19 27 19.57	151.74	−20 8 59.5	+138.3	70.55	15 53.4	58 12.3	I.	S.
17	2 42.06	2.230	20 26 31.92	143.99	−18 38 14.2	310.0	68.74	15 39.3	57 20.6	I.	S.
18	3 33.85	2.086	21 22 24.13	135.33	−16 6 19.2	+442.9	66.62	15 25.3	56 29.3	I.	S.
19	4 22.26	1.952	22 14 53.20	127.27	−12 49 13.8	536.4	64 61	15 12.7	55 42.9	I.	S.
20	5 7.75	1.845	23 4 26.98	120.83	− 9 1 37.6	596.5	62.94	15 2.1	55 4.1	I.	S.
21	5 51.08	1.772	23 51 50.02	116.45	− 4 55 43.8	629.0	61.77	14 54.3	54 35.3	I.	S.
22	6 33.09	1.736	0 37 54.46	114.30	− 0 41 28.7	638.8	61.18	14 49.4	54 17.3	I.	S.
23	7 14.69	1.737	1 23 33.80	114.35	+ 3 32 37.4	+628.4	61.16	16 47.5	54 10.4	I.	S.
24	7 56.74	1.773	2 9 39.95	116.50	7 38 30.6	597.6	61.69	14 48.5	54 14.1	I.	S.
25	8 40.02	1.839	2 57 0.82	120.52	11 27 38.3	544.2	62.72	14 52.2	54 27.8	I.	S.
26	9 25.22	1.931	3 46 16.78	126.01	14 50 17.7	464.5	64.11	14 58.1	54 49.4	I.	S.
27	10 12.79	2.035	4 37 55.24	132.26	17 35 23.5	355.9	65.67	15 5.7	55 17.3	I.	S.
28	11 2.85	2.135	5 32 3.61	138.31	+19 31 0.9	+217.4	67.16	15 14.4	55 49.3	I.	S.
29	11 55.09	2.213	6 28 23.26	143.01	20 25 54.4	+ 53.5	68.31	15 23.6	56 23.0	I.	S.
30	12 48.78	2.253	7 26 9.90	145.45	20 11 48.0	−125.5	68.92	15 32.7	56 56.3	I.	S.
31	13 42.93	2.252	8 24 24.22	145.35	18 45 41.3	−303.8	68.95	15 41.3	57 27.9	II.	S.
32	14 36.60	2.217	9 22 10.48	143.26	+16 10 58.4	−465.9	68.48	15 48.8	57 55.6	II.	S.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	22 37.8	17 21 43.60	−22 27 26.9	7.3	2.8	0.20	Feb. 16	0 47.1	22 32 46.01	−10 40 33.6	6.8	2.5	0.17
1	22 39.8	17 27 37.30	22 40 38.7	7.3	2.8	0.20	17	0 50.0	22 39 35.84	9 52 30.3	6.9	2.6	0.17
2	22 41.8	17 33 36.47	22 52 57.9	7.2	2.7	0.20	18	0 52.8	22 46 22.30	9 3 27 5	6.9	2.6	0.17
3	22 43.9	17 39 40.69	23 4 21.2	7.2	2.7	0.20	19	0 55.5	22 53 4.68	8 13 32.6	7.0	2.7	0.17
4	22 46.1	17 45 49.57	23 14 45.7	7.1	2.7	0.19	20	0 58.2	22 59 42.12	7 22 54.3	7.1	2.7	0.17
5	22 48.4	17 52 2.78	−23 24 8.7	7.0	2.7	0.19	21	1 0.8	23 6 13.66	− 6 31 42.4	7.3	2.7	0.18
6	22 50.7	17 58 20.02	23 32 27.8	6.9	2.6	0.19	22	1 3.3	23 12 38.24	5 40 8.3	7.4	2.8	0.18
7	22 53.1	18 4 41.01	23 39 40.7	6.8	2.6	0.19	23	1 5.6	23 18 54.61	4 48 24.8	7.5	2.8	0.18
8	22 55.6	18 11 5.47	23 45 45.5	6.8	2.6	0.19	24	1 7.8	23 25 1.36	3 56 46.2	7.6	2.9	0.19
9	22 58.1	18 17 33.17	23 50 40.2	6.7	2.6	0.18	25	1 9.8	23 30 56.99	3 5 28.3	7.8	2.9	0.19
10	23 0.6	18 24 3.90	−23 54 23.1	6.7	2.5	0.18	26	1 11.6	23 36 39.86	− 2 14 48.3	8.0	3.0	0.20
11	23 3.2	18 30 37.46	23 56 52.7	6.6	2.5	0.18	27	1 13.1	23 42 8.21	1 25 4.7	8.2	3.1	0.20
12	23 5.9	18 37 13.65	23 58 7.2	6.6	2.5	0.18	28	1 14 3	23 47 20.20	− 0 36 36.9	8.4	3.1	0.21
13	23 8.6	18 43 52.30	23 58 5.4	6.6	2.5	0.18	Mar. 1	1 15.3	23 52 13.94	+ 0 10 14.9	8.7	3.2	0.22
14	23 11.4	18 50 33.24	23 56 46.1	6.5	2.5	0.18	2	1 15.9	23 56 47.53	0 55 10.2	8.9	3.3	0.22
15	23 14.1	18 57 16.32	−23 54 8.1	6.5	2.5	0.18	3	1 16.1	0 0 59.12	+ 1 37 48.7	9.2	3.4	0.23
16	23 16.9	19 4 1.38	23 50 10.2	6.5	2.4	0.18	4	1 16.0	0 4 46.90	2 17 50.1	9.5	3.5	0.23
17	23 19.8	19 10 48.27	23 44 51.3	6.4	2.4	0.18	5	1 15.5	0 8 9.19	2 54 54.6	9.7	3.7	0.24
18	23 22.6	19 17 36.85	23 38 10.4	6.4	2.4	0.18	6	1 14.5	0 11 4.47	3 28 43.5	10.0	3.8	0.25
19	23 25.5	19 24 27.00	23 30 6.6	6.4	2.4	0.17	7	1 13.0	0 13 31.45	3 58 59.5	10.3	3.9	0.25
20	23 28.4	19 31 18.60	−23 20 39.0	6.3	2.4	0.17	8	1 11.0	0 15 29.10	+ 4 25 26.5	10.6	4.0	0.26
21	23 31.3	19 38 11.53	23 9 46.8	6.3	2.4	0.17	9	1 8.6	0 16 56.68	4 47 49.9	11.0	4.1	0.27
22	23 34.3	19 45 5.68	22 57 29.1	6.3	2.4	0.17	10	1 5.6	0 17 53.78	5 5 57.4	11.3	4.3	0.28
23	23 37.2	19 52 0.95	22 43 45.2	6.3	2.4	0.17	11	1 2.1	0 18 20.43	5 19 39.5	11.7	4.4	0.29
24	23 40.2	19 58 57.23	22 28 34.5	6.3	2.4	0.17	12	0 58.1	0 18 17.10	5 28 49.1	12.0	4.5	0.30
25	23 43.2	20 5 54.42	−22 11 56.4	6.3	2.4	0.17	13	0 53.6	0 17 44.62	+ 5 33 21.7	12.3	4.6	0.31
26	23 46.2	20 12 52.43	21 53 50.3	6.3	2.4	0.17	14	0 48.6	0 16 44.38	5 33 16.9	12.6	4.7	0.32
27	23 49.3	20 19 51.16	21 34 15.6	6.3	2.4	0.17	15	0 43.2	0 15 18.26	5 28 38.5	13.0	4.9	0.32
28	23 52.3	20 26 50.54	21 13 11.7	6.3	2.4	0.16	16	0 37.4	0 13 28.59	5 19 34.1	13.3	5.0	0.33
29	23 55.3	20 33 50.47	20 50 38.4	6.3	2.4	0.16	17	0 31.3	0 11 18.16	5 6 15.8	13.6	5.1	0.34
30	23 58.4	20 40 50.91	−20 26 35.1	6.3	2.4	0.16	18	0 25.0	0 8 50.20	+ 4 49 1.0	13.9	5.2	0.34
Feb. 1	0 1.5	20 47 51.78	20 1 1.5	6.3	2.4	0.16	19	0 18.4	0 6 8.29	4 28 11.2	14.1	5.3	0.35
2	0 4.5	20 54 52.98	19 33 57.5	6.3	2.4	0.16	20	0 11.5	0 3 16.20	4 4 13.2	14.3	5.4	0.35
3	0 7.6	21 1 54.45	19 5 23.0	6.3	2.4	0.16	21	0 4.6	0 0 17.87	3 37 36.1	14.5	5.4	0.36
4	0 10.7	21 8 56.11	18 35 17.9	6.3	2.4	0.16	21	23 57.7	23 57 17.23	3 8 52.4	14.6	5.5	0.36
5	0 13.7	21 15 57.87	−18 3 42.4	6.3	2.4	0.16	22	23 50.8	23 54 18.11	+ 2 38 35.9	14.7	5.5	0.36
6	0 16.8	21 22 59.65	17 30 36.5	6.3	2.4	0.16	23	23 44.0	23 51 24.14	2 7 21.1	14.8	5.5	0.36
7	0 19.9	21 30 1.35	16 56 0.6	6.4	2.4	0.16	24	23 37.4	23 48 38.65	1 35 41.7	14.8	5.5	0.37
8	0 23.0	21 37 2.85	16 19 55.4	6.4	2.4	0.16	25	23 30.8	23 46 4.57	1 4 10.0	14.7	5.5	0.37
9	0 26.1	21 44 4.03	15 42 21.7	6.4	2.4	0.16	26	23 24.5	23 43 44.41	0 33 15.8	14.7	5.5	0.37
10	0 29.1	21 51 4.73	−15 3 20.6	6.5	2.4	0.16	27	23 18.5	23 41 40.26	+ 0 3 25.4	14.6	5.4	0.36
11	0 32.2	21 58 4.78	14 22 53.6	6.5	2.5	0.16	28	23 12.9	23 39 53.75	− 0 24 58.1	14.4	5.4	0.36
12	0 35.2	22 5 3.96	13 41 2.6	6.6	2.5	0.16	29	23 7.5	23 38 26.05	0 51 35.4	14.3	5.4	0.36
13	0 38.2	22 12 2.01	12 57 49.7	6.6	2.5	0.17	30	23 2.4	23 37 17.95	1 16 11.2	14.1	5.3	0.35
14	0 41.2	22 18 58.62	12 13 18.0	6.7	2.5	0.17	31	22 57.7	23 36 29.92	1 38 33.1	14.0	5.3	0.35
15	0 44.2	22 25 53.43	−11 27 31.2	6.7	2.5	0.17	32	22 53.3	23 36 2.10	− 1 58 32.4	13.8	5.2	0.34
16	0 47.1	22 32 46.01	−10 40 33.6	6.8	2.5	0.17	33	22 49.3	23 35 54.36	− 2 16 2.6	13.6	5.1	0.34

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	22 53.3	23 36 2.10	− 1 58 32.4	13.8	5.2	0.34	May 17	23 14.8	2 59 0.13	+15 55 41.6	6.9	2.6	0.18
2	22 49.3	23 35 54.36	2 16 2.6	13.6	5.1	0.34	18	23 18.9	3 7 0.95	16 39 29.9	6.9	2.6	0.17
3	22 45.6	23 36 6.39	2 31 0.2	13.4	5.1	0.33	19	23 23.2	3 15 12.22	17 22 45.3	6.8	2.6	0.17
4	22 42.2	23 36 37.66	2 43 23.8	13.2	5.0	0.33	20	23 27.6	3 23 33.77	18 5 16.9	6.8	2.6	0.17
5	22 39.1	23 37 27.65	2 53 13.2	12.9	4.9	0.32	21	23 32.1	3 32 5.32	18 46 53.4	6.8	2.5	0.17
6	22 36.2	23 38 35.60	− 3 0 29.5	12.7	4.8	0.31	22	23 36.9	3 40 46.44	+19 27 22.7	6.8	2.5	0.17
7	22 33.7	23 40 0.79	3 5 15.5	12.5	4.7	0.31	23	23 41.8	3 49 36.56	20 6 32.2	6.7	2.5	0.17
8	22 31.5	23 41 42.42	3 7 34.1	12.2	4.7	0.30	24	23 46.8	3 58 34.95	20 44 9.3	6.7	2.5	0.17
9	22 29.5	23 43 39.71	3 7 28.6	12.0	4.6	0.30	25	23 51.9	4 7 40.71	21 20 1.7	6.7	2.5	0.18
10	22 27.7	23 45 51.87	3 5 3.3	11.8	4.5	0.29	26	23 57.1	4 16 52.77	21 53 57.1	6.7	2.5	0.18
11	22 26.2	23 48 18.13	− 3 0 22.5	11.6	4.4	0.29	28	0 2.5	4 26 9.93	+22 25 44.0	6.7	2.5	0.18
12	22 25.0	23 50 57.77	2 53 30.6	11.4	4.3	0.28	29	0 7.9	4 35 30.88	22 55 12.4	6.8	2.5	0.18
13	22 23.9	23 53 50.07	2 44 32.0	11.2	4.2	0.28	30	0 13.3	4 44 54.20	23 22 13.0	6.8	2.5	0.18
14	22 23.0	23 56 54.34	2 33 31.2	11.0	4.2	0.27	31	0 18.8	4 54 18.42	23 46 38.4	6.8	2.6	0.18
15	22 22.4	0 0 9.97	2 20 32.7	10.8	4.1	0.27	June 1	0 24.2	5 3 42.06	24 8 23.0	6.8	2.6	0.18
16	22 21.9	0 3 36.38	− 2 5 40.6	10.6	4.0	0.27	2	0 29.6	5 13 3.65	+24 27 22.9	6.9	2.6	0.19
17	22 21.6	0 7 13.06	1 48 59.1	10.4	4.0	0.26	3	0 35.0	5 22 21.77	24 43 35.6	6.9	2.6	0.19
18	22 21.4	0 10 59.51	1 30 32.2	10.2	3.9	0.26	4	0 40.2	5 31 35.08	24 57 0.7	6.9	2.6	0.19
19	22 21.3	0 14 55.28	1 10 23.8	10.0	3.8	0.25	5	0 45.3	5 40 42.33	25 7 39.5	7.0	2.7	0.19
20	22 21.4	0 18 59.95	0 48 37.7	9.9	3.7	0.25	6	0 50.4	5 49 42.39	25 15 34.8	7.0	2.7	0.19
21	22 21.8	0 23 13.19	− 0 25 17.6	9.7	3.7	0.25	7	0 55.4	5 58 34.24	+25 20 50.2	7.1	2.7	0.19
22	22 22.2	0 27 34.72	− 0 0 26.8	9.6	3.6	0.24	8	1 0.1	6 7 16.99	25 23 30.7	7.2	2.8	0.20
23	22 22.7	0 32 4.26	+ 0 25 51.2	9.4	3.5	0.24	9	1 4.7	6 15 49.84	25 23 42.0	7.3	2.8	0.20
24	22 23.4	0 36 41.59	0 53 33.2	9.3	3.5	0.23	10	1 9.1	6 24 12.14	25 21 30.4	7.5	2.8	0.20
25	22 24.2	0 41 26.53	1 22 35.9	9.1	3.4	0.23	11	1 13.3	6 32 23.33	25 17 2.9	7.6	2.9	0.20
26	22 25.1	0 46 18.93	+ 1 52 56.5	9.0	3.4	0.23	12	1 17.3	6 40 22.96	+25 10 26.9	7.7	2.9	0.21
27	22 26.1	0 51 18.70	2 24 32.0	8.8	3.3	0.22	13	1 21.2	6 48 10.64	25 1 49.5	7.8	2.9	0.21
28	22 27.3	0 56 25.77	2 57 19.4	8.7	3.3	0.22	14	1 24.8	6 55 46.05	24 51 18.1	7.9	3.0	0.21
29	22 28.6	1 1 40.12	3 31 15.8	8.6	3.2	0.21	15	1 28.2	7 3 8.96	24 39 0.4	8.0	3.0	0.22
30	22 30.0	1 7 1.73	4 6 18.4	8.5	3.2	0.21	16	1 31.4	7 10 19.16	24 25 3.9	8.1	3.1	0.22
May 1	22 31.5	1 12 30.66	+ 4 42 24.3	8.4	3.1	0.21	17	1 34.4	7 17 16.47	+24 9 35.9	8.2	3.1	0.22
2	22 33.2	1 18 6.98	5 19 30.7	8.3	3.1	0.20	18	1 37.2	7 24 0.77	23 52 43.5	8.4	3.2	0.23
3	22 35.0	1 23 50.78	5 57 34.5	8.1	3.1	0.20	19	1 39.8	7 30 31.96	23 34 34.0	8.5	3.2	0.23
4	22 36.9	1 29 42.19	6 36 32.7	8.0	3.0	0.20	20	1 42.2	7 36 49.94	23 15 14.6	8.7	3.3	0.23
5	22 38.9	1 35 41.39	7 16 22.1	7.9	3.0	0.19	21	1 44.3	7 42 54.62	22 54 51.9	8.9	3.4	0.23
6	22 41.1	1 41 48.54	+ 7 56 59.5	7.8	3.0	0.19	22	1 46.2	7 48 45.90	+22 33 32.6	9.0	3.4	0.24
7	22 43.4	1 48 3.86	8 38 21.3	7.7	2.9	0.19	23	1 47.9	7 54 23.70	22 11 23.3	9.2	3.5	0.24
8	22 45.8	1 54 27.57	9 20 23.7	7.6	2.9	0.19	24	1 49.4	7 59 47.92	21 48 30.5	9.4	3.5	0.24
9	22 48.4	2 0 59.91	10 3 2.7	7.5	2.9	0.19	25	1 50.6	8 4 58.46	21 25 0.4	9.6	3.6	0.25
10	22 51.2	2 7 41.14	10 46 13.8	7.4	2.8	0.19	26	1 51.6	8 9 55.20	21 0 59.4	9.8	3.7	0.25
11	22 54.1	2 14 31.53	+11 29 52.3	7.3	2.8	0.19	27	1 52.3	8 14 37.99	+20 36 33.6	10.0	3.7	0.26
12	22 57.1	2 21 31.35	12 13 53.0	7.2	2.8	0.18	28	1 52.8	8 19 6.67	20 11 49.1	10.1	3.8	0.26
13	23 0.3	2 28 40.87	12 58 9.9	7.2	2.7	0.18	29	1 53.1	8 23 21.06	19 46 52.1	10.3	3.9	0.27
14	23 3.7	2 36 0.32	13 42 36.5	7.1	2.7	0.18	30	1 53.2	8 27 20.98	19 21 48.8	10.5	4.0	0.27
15	23 7.2	2 43 29.90	14 27 6.0	7.0	2.7	0.18	31	1 53.0	8 31 6.19	18 56 45.1	10.7	4.1	0.27
16	23 10.9	2 51 9.80	+15 11 30.6	7.0	2.6	0.18	32	1 52.6	8 34 36.44	+18 31 47.3	10.9	4.2	0.28
17	23 14.8	2 59 0.13	+15 55 41.6	6.9	2.6	0.18	33	1 51.9	8 37 51.44	+18 7 1.7	11.1	4.2	0.29

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	1 53.0	8 31 6.19	+18 56 45.1	10.7	4.1	0.27	Aug. 15	22 48.7	8 27 39.41	+18 8 7.2	9.8	3.7	0.25
2	1 52.6	8 34 36.44	18 31 47.3	10.9	4.2	0.28	16	22 49.1	8 31 59.78	18 9 8.6	9.5	3.6	0.24
3	1 51.9	8 37 51.44	18 7 1.7	11.1	4.2	0.29	17	22 49.9	8 36 45.87	18 7 40.1	9.2	3.5	0.24
4	1 51.0	8 40 50.90	17 42 34.4	11.3	4.3	0.29	18	22 51.2	8 41 56.28	18 3 34.0	9.0	3.4	0.23
5	1 49.8	8 43 34.50	17 18 31.7	11.5	4.3	0.30	19	22 52.7	8 47 29.46	17 56 43.3	8.7	3.3	0.22
6	1 48.3	8 46 1.92	+16 55 0.1	11.8	4.4	0.31	20	22 54.7	8 53 23.67	+17 47 3.2	8.5	3.2	0.22
7	1 46.5	8 48 12.82	16 32 6.3	12.0	4.5	0.31	21	22 57.0	8 59 37.01	17 34 30.0	8.3	3.1	0.21
8	1 44.5	8 50 6.83	16 9 57.0	12.3	4.6	0.32	22	22 59.6	9 6 7.42	17 19 2.2	8.1	3.1	0.21
9	1 42.2	8 51 43.57	15 48 39.0	12.5	4.7	0.32	23	23 2.4	9 12 52.76	17 0 40.1	7.9	3.0	0.20
10	1 39.6	8 53 2.69	15 28 19.1	12.7	4.8	0.33	24	23 5.4	9 19 50.88	16 39 26.1	7.7	3.0	0.20
11	1 36.7	8 54 3.93	+15 9 4.1	12 9	4.9	0.33	25	23 8.6	9 26 59.60	+16 15 24.3	7.5	2.9	0.19
12	1 33.5	8 54 46.95	14 51 1.1	13.1	4.9	0.34	26	23 11.9	9 34 16.78	15 48 41.1	7.4	2.8	0.19
13	1 29.9	8 55 11.52	14 34 17.2	13.4	5.0	0.34	27	23 15.3	9 41 40.36	15 19 24.2	7.3	2.8	0.19
14	1 26.1	8 55 17.45	14 18 59.1	13.6	5.1	0.35	28	23 18.8	9 49 8.40	14 47 42.8	7.2	2.7	0.18
15	1 21.9	8 55 4.68	14 5 13.4	13.8	5.2	0.35	29	23 22.4	9 56 39.12	14 13 47.0	7.1	2.7	0.18
16	1 17.4	8 54 33.26	+13 53 6.5	14.0	5.3	0.35	30	23 26.0	10 4 10.97	+13 37 48.0	7.0	2.7	0.18
17	1 12.6	8 53 43.35	13 42 44.6	14.2	5.3	0.36	31	23 29.5	10 11 42.55	12 59 56.8	6.9	2.6	0.18
18	1 7.6	8 52 35.32	13 34 12.8	14.4	5.4	0.36	Sept. 1	23 33.1	10 19 12.64	12 20 24.8	6.8	2.6	0.17
19	1 2.3	8 51 9.73	13 27 35.9	14.6	5.4	0.37	2	23 36.6	10 26 40.23	11 39 23.5	6.7	2.5	0.17
20	0 56.7	8 49 27.36	13 22 57.9	14.7	5.5	0.37	3	23 40.1	10 34 4.50	10 57 3.7	6.7	2.5	0.17
21	0 50.7	8 47 29.27	+13 20 21.5	14.8	5.5	0.37	4	23 43.5	10 41 24.81	+10 13 35.8	6.6	2.5	0.17
22	0 44.6	8 45 16.75	13 19 48.1	14.9	5.6	0.38	5	23 46.8	10 48 40.69	9 29 9.8	6.6	2.5	0.17
23	0 38.3	8 42 51.45	13 21 17.5	15.0	5.6	0.38	6	23 50.0	10 55 51.75	8 43 55.0	6.5	2.5	0.16
24	0 31.7	8 40 15.27	13 24 48.4	15.1	5.7	0.39	7	23 53.1	11 2 57.74	7 57 59.8	6.5	2.4	0.16
25	0 25.1	8 37 30.37	13 30 17.9	15.1	5.7	0.39	8	23 56.2	11 9 58.50	7 11 32.0	6.5	2.4	0.16
26	0 18.4	8 34 39.25	+13 37 41.1	15.0	5.7	0.39	9	23 59.2	11 16 53.98	+ 6 24 38.8	6.5	2.4	0.16
27	0 11.5	8 31 44.57	13 46 51.4	15.0	5.6	0.39	11	0 2.1	11 23 44.20	5 37 26.7	6.4	2.4	0.16
28	0 4.6	8 28 49.26	13 57 40.6	14.9	5.6	0.38	12	0 4.9	11 30 29.20	4 50 1.6	6.4	2.4	0.16
28	23 57.8	8 25 56.35	14 9 59.1	14.8	5.5	0.38	13	0 7.6	11 37 9.08	4 2 28.9	6.4	2.4	0.16
29	23 51.0	8 23 8.95	14 23 36.3	14.7	5.5	0.38	14	0 10.2	11 43 43.98	3 14 53.3	6.4	2.4	0.16
30	23 44.5	8 20 30.17	+14 38 20.4	14.5	5.4	0.37	15	0 12.8	11 50 14.07	+ 2 27 19.0	6.4	2.4	0.15
31	23 38.1	8 18 3.01	14 53 58.7	14.3	5.4	0.37	16	0 15.3	11 56 39.52	1 39 50.1	6.3	2.4	0.15
Aug. 1	23 32.0	8 15 50.41	15 10 18.0	14.1	5.3	0.36	17	0 17.7	12 3 0.52	0 52 30.1	6.3	2.4	0.15
2	23 26.2	8 13 55.12	15 27 4.9	13.9	5.2	0.36	18	0 20.0	12 9 17.27	+ 0 5 22.0	6.3	2.4	0.15
3	23 20.7	8 12 19.65	15 44 5.5	13.6	5.1	0.35	19	0 22.3	12 15 29.98	− 0 41 31.1	6.3	2.4	0.15
4	23 15.6	8 11 6.24	+16 1 6.4	13.3	5.0	0.34	20	0 24.4	12 21 38.85	− 1 28 6.7	6.3	2.4	0.15
5	23 10.8	8 10 16.82	16 17 54.3	13.0	4.9	0.33	21	0 26.6	12 27 44.09	2 14 22.3	6.3	2.4	0.15
6	23 6.4	8 9 53.04	16 34 16.0	12.6	4.8	0.33	22	0 28.7	12 33 45.90	3 0 15.7	6.4	2.4	0.15
7	23 2.5	8 9 56.23	16 49 58.7	12.3	4.6	0.32	23	0 30.7	12 39 44.49	3 45 45.0	6.4	2.4	0.16
8	22 59.1	8 10 27.44	17 4 49.8	12.0	4.5	0.31	24	0 32.7	12 45 40.03	4 30 48.3	6.4	2.4	0.16
9	22 56.2	8 11 27.42	+17 18 37.0	11.7	4.4	0.30	25	0 34.6	12 51 32.73	− 5 15 23.8	6.4	2.4	0.16
10	22 53.7	8 12 56.59	17 31 8.4	11.3	4.3	0.29	26	0 36.5	12 57 22.72	5 59 29.9	6.5	2.4	0.16
11	22 51.8	8 14 55.19	17 42 12.2	11.0	4.1	0.29	27	0 38.4	13 3 10.20	6 43 5.2	6.5	2.4	0.16
12	22 50.3	8 17 23.19	17 51 36.9	10.7	4.0	0.28	28	0 40.2	13 8 55.33	7 26 8.0	6.5	2.5	0.16
13	22 49.3	8 20 20.26	17 59 11.4	10.4	3.9	0.27	29	0 42.0	13 14 38.24	8 8 37.0	6.5	2.5	0.16
14	22 48.8	8 23 45.91	+18 4 44.9	10.1	3.8	0.26	30	0 43.6	13 20 19.06	− 8 50 30.8	6.6	2.5	0.16
15	22 48.7	8 27 39.41	+18 8 7.2	9.8	3.7	0.25	31	0 45.3	13 25 57.93	− 9 31 48.0	6.6	2.5	0.17

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Oct. 1	0 45.3	13 25 57.93	- 9 31 48.0	6.6	2.5	0.17
2	0 47.0	13 31 34.96	10 12 27.4	6.6	2.5	0.17
3	0 48.7	13 37 10.22	10 52 27.8	6.7	2.5	0.17
4	0 50.3	13 42 43.79	11 31 47.9	6.7	2.5	0.17
5	0 51.9	13 48 15.76	12 10 26.4	6.8	2.5	0.17
6	0 53.4	13 53 46.18	-12 48 21.9	6.8	2.6	0.17
7	0 55.0	13 59 15.05	13 25 33.1	6.9	2.6	0.17
8	0 56.5	14 4 42.37	14 1 58.6	6.9	2.6	0.17
9	0 58.0	14 10 8.12	14 37 37.0	7.0	2.6	0.17
10	0 59.5	14 15 32.28	15 12 26.8	7.0	2.6	0.18
11	1 0.9	14 20 54.79	-15 46 26.7	7.1	2.7	0.18
12	1 2.3	14 26 15.53	16 19 34.9	7.1	2.7	0.18
13	1 3.6	14 31 34.37	16 51 49.7	7.2	2.7	0.18
14	1 5.0	14 36 51.15	17 23 9.4	7.3	2.7	0.18
15	1 6.3	14 42 5.66	17 53 32.2	7.4	2.8	0.19
16	1 7.6	14 47 17.64	-18 22 56.1	7.4	2.8	0.19
17	1 8.7	14 52 26.79	18 51 19.0	7.5	2.9	0.19
18	1 9.8	14 57 32.74	19 18 38.6	7.6	2.9	0.20
19	1 10.9	15 2 35.09	19 44 52.7	7.7	2.9	0.20
20	1 12.0	15 7 33.36	20 9 58.7	7.8	3.0	0.20
21	1 13.0	15 12 26.96	-20 33 54.0	8.0	3.0	0.21
22	1 13.8	15 17 15.23	20 56 35.7	8.1	3.1	0.21
23	1 14.6	15 21 57.45	21 18 0.7	8.2	3.1	0.22
24	1 15.2	15 26 32.74	21 38 5.4	8.3	3.2	0.22
25	1 15.7	15 31 0.15	21 56 46.2	8.5	3.2	0.23
26	1 16.1	15 35 18.57	-22 13 59.4	8.6	3.3	0.23
27	1 16.3	15 39 26.73	22 29 40.5	8.8	3.3	0.24
28	1 16.3	15 43 23.25	22 43 44.7	9.0	3.4	0.24
29	1 16.0	15 47 6.54	22 56 6.9	9.2	3.5	0.25
30	1 15.6	15 50 34.83	23 6 41.2	9.4	3.6	0.25
31	1 14.8	15 53 46.16	-23 15 21.2	9.6	3.6	0.26
Nov. 1	1 13.8	15 56 38.37	23 21 59.7	9.8	3.7	0.26
2	1 12.4	15 59 9.11	23 26 28.8	10.0	3.8	0.27
3	1 10.6	16 1 15.85	23 28 39.7	10.2	3.9	0.28
4	1 8.3	16 2 55.91	23 28 22.9	10.5	4.0	0.28
5	1 5.5	16 4 6.49	-23 25 27.9	10.7	4.0	0.29
6	1 2.2	16 4 44.81	23 19 43.1	10.9	4.1	0.29
7	0 58.4	16 4 48.18	23 10 56.5	11.2	4.2	0.30
8	0 53.9	16 4 14.18	22 58 56.5	11.4	4.3	0.30
9	0 48.8	16 3 0.89	22 43 31.9	11.7	4.4	0.31
10	0 42.9	16 1 7.16	-22 24 33.8	12.0	4.5	0.32
11	0 36.4	15 58 32.90	22 1 56.0	12.3	4.6	0.32
12	0 29.3	15 55 19.36	21 35 39.0	12.5	4.7	0.33
13	0 21.5	15 51 29.46	21 5 50.3	12.7	4.7	0.33
14	0 13.2	15 47 7.90	20 32 48.0	12.8	4.8	0.33
15	0 4.4	15 42 21.25	-19 57 2.6	12.9	4.8	0.33
15	23 55.4	15 37 17.78	-19 19 17.2	13.0	4.9	0.34
Nov. 15	23 55.4	15 37 17.78	-19 19 17.2	13.0	4.9	0.34
16	23 46.5	15 32 7.00	18 40 26.0	13.0	4.9	0.34
17	23 37.4	15 26 59.04	18 1 32.2	12.9	4.8	0.34
18	23 28.6	15 22 3.98	17 23 44.3	12.8	4.8	0.33
19	23 20.1	15 17 31.23	16 48 9.5	12.6	4.7	0.33
20	23 12.1	15 13 28.82	-16 15 47.0	12.4	4.7	0.32
21	23 4.7	15 10 2.88	15 47 26.8	12.2	4.6	0.32
22	22 58.0	15 7 17.73	15 23 44.2	12.0	4.5	0.31
23	22 52.1	15 5 15.76	15 5 0.4	11.7	4.4	0.31
24	22 46.8	15 3 57.64	14 51 22.8	11.4	4.3	0.30
25	22 42.4	15 3 22.72	-14 42 46.7	11.0	4.1	0.29
26	22 38.5	15 3 29.28	14 38 58.6	10.7	4.0	0.28
27	22 35.4	15 4 14.83	14 39 38.9	10.4	3.9	0.27
28	22 32.8	15 5 36.53	14 44 22.7	10.1	3.8	0.26
29	22 30.8	15 7 31.31	14 52 43.9	9.9	3.7	0.26
30	22 29.3	15 9 56.10	-15 4 15.1	9.6	3.6	0.25
Dec. 1	22 28.2	15 12 47.89	15 18 30.1	9.3	3.5	0.24
2	22 27.5	15 16 3.83	15 35 3.7	9.1	3.4	0.23
3	22 27.2	15 19 41.30	15 53 32.8	8.9	3.3	0.23
4	22 27.2	15 23 37.96	16 13 35.7	8.7	3.2	0.22
5	22 27.5	15 27 51.68	-16 34 53.2	8.5	3.2	0.22
6	22 28.0	15 32 20.56	16 57 7.9	8.3	3.1	0.21
7	22 28.8	15 37 2.94	17 20 4.4	8.2	3.1	0.21
8	22 29.7	15 41 57.38	17 43 29.0	8.0	3.0	0.21
9	22 30.8	15 47 2.58	18 7 9.6	7.9	3.0	0.20
10	22 32.2	15 52 17.43	-18 30 55.4	7.7	2.9	0.20
11	22 33.7	15 57 40.98	18 54 37.2	7.6	2.9	0.20
12	22 35.2	16 3 12.39	19 18 6.8	7.5	2.9	0.20
13	22 36.8	16 8 50.91	19 41 16.7	7.4	2.8	0.20
14	22 38.6	16 14 35.92	20 4 0.5	7.3	2.8	0.19
15	22 40.5	16 20 26.88	-20 26 12.4	7.2	2.7	0.19
16	22 42.5	16 26 23.28	20 47 47.3	7.1	2.7	0.19
17	22 44.6	16 32 24.71	21 8 40.8	7.0	2.7	0.19
18	22 46.7	16 38 30.82	21 28 48.8	6.9	2.6	0.19
19	22 48.9	16 44 41.27	21 48 7.4	6.9	2.6	0.18
20	22 51.3	16 50 55.78	-22 6 33.4	6.8	2.6	0.18
21	22 53.7	16 57 14.11	22 24 4.1	6.7	2.5	0.18
22	22 56.1	17 3 36.04	22 40 36.4	6.7	2.5	0.18
23	22 58.5	17 10 1.35	22 56 7.9	6.6	2.5	0.18
24	23 1.0	17 16 29.86	23 10 36.3	6 6	2.5	0.18
25	23 3.6	17 23 1.42	-23 23 59.4	6.5	2.5	0.17
26	23 6.2	17 29 35.87	23 36 15.4	6.5	2.4	0.17
27	23 8.9	17 36 13.05	23 47 22.3	6.5	2.4	0.17
28	33 11.6	17 42 52.83	23 57 18.2	6.4	2.4	0.17
29	23 14.4	17 49 35.11	24 6 1.6	6.4	2.4	0.17
30	23 17.2	17 56 19.75	-24 13 31.1	6.3	2.4	0.17
31	23 20.0	18 3 6.63	-24 19 45.3	6.3	2.4	0.17

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Jan. 0	0 33.5	19 13 45.39	−23 19 26.4	5.2	5.0	0.37
1	0 35.0	19 19 12.37	23 11 26.3	5.2	5.0	0.37
2	0 36.5	19 24 38.61	23 2 43.4	5.2	5.0	0.37
3	0 38.0	19 30 4.06	22 53 18.1	5.2	5.0	0.37
4	0 39.4	19 35 28.67	22 43 10.7	5.2	5.1	0.37
5	0 40.9	19 40 52.40	−22 32 21.7	5.2	5.1	0.37
6	0 42.3	19 46 15.20	22 20 51.6	5.2	5.1	0.36
7	0 43.7	19 51 37.02	22 8 40.9	5.2	5.1	0.36
8	0 45.1	19 56 57.83	21 55 50.0	5.3	5.1	0.36
9	0 46.5	20 2 17.60	21 42 19.5	5.3	5.1	0.36
10	0 47.9	20 7 36.28	−21 28 10.0	5.3	5.1	0.36
11	0 49.3	20 12 53.84	21 13 22.0	5.3	5.1	0.36
12	0 50.6	20 18 10.26	20 57 56.2	5.3	5.1	0.36
13	0 51.9	20 23 25.52	20 41 53.2	5.3	5.1	0.36
14	0 53.2	20 28 39.58	20 25 13.5	5.3	5.1	0.36
15	0 54.4	20 33 52.43	−20 7 57.9	5.3	5.1	0.36
16	0 55.6	20 39 4.04	19 50 6.9	5.3	5.1	0.36
17	0 56.8	20 44 14.41	19 31 41.4	5.3	5.1	0.36
18	0 58.0	20 49 23.53	19 12 41.9	5.3	5.1	0.36
19	0 59.2	20 54 31.37	18 53 9.3	5.3	5.1	0.36
20	1 0.4	20 59 37.92	−18 33 4.2	5.3	5.1	0.36
21	1 1.6	21 4 43.18	18 12 27.4	5.3	5.1	0.36
22	1 2.7	21 9 47.16	17 51 19.5	5.3	5.1	0.36
23	1 3.9	21 14 49.85	17 29 41.3	5.3	5.2	0.36
24	1 5.0	21 19 51.23	17 7 33.6	5.3	5.2	0.36
25	1 6.1	21 24 51.31	−16 44 57.3	5.4	5.2	0.36
26	1 7.1	21 29 50.10	16 21 53.1	5.4	5.2	0.36
27	1 8.1	21 34 47.61	15 58 21.7	5.4	5.2	0.36
28	1 9.0	21 39 43.83	15 34 24.0	5.4	5.2	0.36
29	1 10.0	21 44 38.78	15 10 0.7	5.4	5.2	0.36
30	1 10.9	21 49 32.47	−14 45 12.7	5.4	5.2	0.36
31	1 11.8	21 54 24.92	14 20 0.6	5.4	5.2	0.36
Feb. 1	1 12.7	21 59 16.15	13 54 25.3	5.4	5.2	0.36
2	1 13.6	22 4 6.19	13 28 27.6	5.4	5.2	0.36
3	1 14.5	22 8 55.06	13 2 8.3	5.4	5.2	0.36
4	1 15.4	22 13 42.78	−12 35 28.1	5.4	5.2	0.36
5	1 16.2	22 18 29.38	12 8 28.0	5.4	5.3	0.36
6	1 17.0	22 23 14.88	11 41 8.7	5.4	5.3	0.36
7	1 17.8	22 27 59.31	11 13 30.9	5.4	5.3	0.36
8	1 18.5	22 32 42.70	10 45 35.2	5.5	5.3	0.36
9	1 19.2	22 37 25.08	−10 17 22.6	5.5	5.3	0.36
10	1 20.0	22 42 6.49	9 48 53.7	5.5	5.3	0.36
11	1 20.7	22 46 46.96	9 20 9.3	5.5	5.3	0.36
12	1 21.5	22 51 26.54	8 51 10.7	5.5	5.3	0.36
13	1 22.2	22 56 5.27	8 21 58.0	5.5	5.3	0.36
14	1 22.9	23 0 43.17	− 7 52 32.4	5.5	5.3	0.36
15	1 23.6	23 5 20.29	− 7 22 54.4	5.5	5.3	0.36
Feb. 15	1 23.6	23 5 20.29	− 7 22 54.4	5.5	5.3	0.36
16	1 24.3	23 9 56.67	6 53 4.8	5.5	5.3	0.36
17	1 24.9	23 14 32.34	6 23 4.3	5.5	5.4	0.36
18	1 25.5	23 19 7.34	5 52 53.8	5.6	5.4	0.36
19	1 26.1	23 23 41.70	5 22 34.1	5.6	5.4	0.36
20	1 26.7	23 28 15.47	− 4 52 6.0	5.6	5.4	0.36
21	1 27.3	23 32 48.69	4 21 30.1	5.6	5.4	0.36
22	1 27.9	23 37 21.39	3 50 47.1	5.6	5.4	0.36
23	1 28.5	23 41 53.63	3 19 57.8	5.6	5.4	0.36
24	1 29.1	23 46 25.44	2 49 3.0	5.6	5.4	0.36
25	1 29.7	23 50 56.84	− 2 18 3.5	5.6	5.4	0.36
26	1 30.3	23 55 27.88	1 47 0.1	5.6	5.5	0.36
27	1 30.8	23 59 58.61	1 15 53.5	5.7	5.5	0.36
28	1 31.4	0 4 29.06	0 44 44.5	5.7	5.5	0.37
Mar. 1	1 31.9	0 8 59.28	− 0 13 33.8	5.7	5.5	0.37
2	1 32.5	0 13 29.31	+ 0 17 37.9	5.7	5.5	0.37
3	1 33.1	0 17 59.19	0 48 49.8	5.7	5.5	0.37
4	1 33.7	0 22 28.96	1 20 1.2	5.7	5.5	0.37
5	1 34.2	0 26 58.66	1 51 11.4	5.7	5.6	0.37
6	1 34.8	0 31 28.34	2 22 19.5	5.8	5.6	0.37
7	1 35.3	0 35 58.05	+ 2 53 25.0	5.8	5.6	0.37
8	1 35.9	0 40 27.81	3 24 27.0	5.8	5.6	0.37
9	1 36.4	0 44 57.68	3 55 24.8	5.8	5.6	0.37
10	1 37.0	0 49 27.69	4 26 17.7	5.8	5.6	0.38
11	1 37.6	0 53 57.91	4 57 5.0	5.8	5.6	0.38
12	1 38.2	0 58 28.36	+ 5 27 45.9	5.9	5.7	0.38
13	1 38.8	1 2 59.09	5 58 19.7	5.9	5.7	0.38
14	1 39.4	1 7 30.15	6 28 45.7	5.9	5.7	0.38
15	1 39.9	1 12 1.56	6 59 3.2	5.9	5.7	0.38
16	1 40.5	1 16 33.38	7 29 11.5	5.9	5.7	0.38
17	1 41.0	1 21 5.64	+ 7 59 9.9	5.9	5.7	0.38
18	1 41.6	1 25 38.37	8 28 57.5	6.0	5.7	0.39
19	1 42.2	1 30 11.63	8 58 33.6	6.0	5.8	0.39
20	1 42.8	1 34 45.43	9 27 57.6	6.0	5.8	0.39
21	1 43.4	1 39 19.83	9 57 8.7	6.0	5.8	0.39
22	1 44.0	1 43 54.87	+10 26 6.2	6.0	5.8	0.39
23	1 44.7	1 48 30.55	10 54 49.2	6.0	5.8	0.39
24	1 45.3	1 53 6.91	11 23 17.0	6.1	5.8	0.40
25	1 46.0	1 57 43.99	11 51 28.9	6.1	5.9	0.40
26	1 46.7	2 2 21.81	12 19 24.1	6.1	5.9	0.40
27	1 47.4	2 7 0.39	+12 47 1.9	6.1	5.9	0.40
28	1 48.1	2 11 39.77	13 14 21.5	6.1	5.9	0.41
29	1 48.8	2 16 19.96	13 41 22.3	6.2	5.9	0.41
30	1 49.6	2 21 0.99	14 8 3.4	6.2	6.0	0.41
31	1 50.4	2 25 42.88	14 34 24.0	6.2	6.0	0.41
32	1 51.2	2 30 25.64	+15 0 23.5	6.2	6.0	0.41
33	1 52.0	2 35 9.31	+15 26 1.1	6.2	6.0	0.42

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	1 51.2	2 30 25.64	+15 0 23.5	6.2	6.0	0.41	May 17	2 41.0	6 21 47.19	+25 27 56.8	7.7	7.5	0.55
2	1 52.0	2 35 9.31	15 26 1.1	6.2	6.0	0.42	18	2 42.2	6 26 55.32	25 26 22.1	7.8	7.5	0.56
3	1 52.8	2 39 53.89	15 51 16.0	6.3	6.1	0.42	19	2 43.4	6 32 2.81	25 24 5.8	7.8	7.6	0.56
4	1 53.6	2 44 39.40	16 16 7.4	6.3	6.1	0.42	20	2 44.5	6 37 9.61	25 21 8.1	7.9	7.6	0.56
5	1 54.4	2 49 25.85	16 40 34.7	6.3	6.1	0.43	21	2 45.7	6 42 15.64	25 17 29.4	7.9	7.7	0.57
6	1 55.3	2 54 13.26	+17 4 37.2	6.3	6.1	0.43	22	2 46.8	6 47 20.84	+25 13 9.9	8.0	7.7	0.57
7	1 56.2	2 59 1.65	17 28 14.3	6.4	6.2	0.43	23	2 47.9	6 52 25.13	25 8 9.9	8.1	7.8	0.57
8	1 57.0	3 3 51.03	17 51 25.0	6.4	6.2	0.43	24	2 49.0	6 57 28.46	25 2 29.7	8.1	7.8	0.58
9	1 57.9	3 8 41.39	18 14 8.7	6.4	6.2	0.43	25	2 50.1	7 2 30.76	24 56 9.6	8.2	7.9	0.58
10	1 58.8	3 13 32.74	18 36 24.7	6.4	6.2	0.44	26	2 51.2	7 7 31.95	24 49 9.9	8.2	7.9	0.58
11	1 59.7	3 18 25.10	+18 58 12.3	6.5	6.2	0.44	27	2 52.3	7 12 31.99	+24 41 31.0	8.3	8.0	0.59
12	2 0.7	3 23 18.47	19 19 30.8	6.5	6.3	0.44	28	2 53.3	7 17 30.79	24 33 13.4	8.3	8.0	0.59
13	2 1.6	3 28 12.84	19 40 19.6	6.5	6.3	0.44	29	2 54.3	7 22 28.30	24 24 17.7	8.4	8.1	0.59
14	2 2.6	3 33 8.22	20 0 37.9	6.5	6.3	0.45	30	2 55.3	7 27 24.47	24 14 44.1	8.5	8.2	0.60
15	2 3.6	3 38 4.59	20 20 25.2	6.6	6.4	0.45	31	2 56.3	7 32 19.24	24 4 33.2	8.5	8.2	0.60
16	2 4.6	3 43 1.94	+20 39 40.9	6.6	6.4	0.45	June 1	2 57.3	7 37 12.56	+23 53 45.5	8.6	8.3	0.60
17	2 5.6	3 48 0.26	20 58 24.2	6.6	6.4	0.46	2	2 58.2	7 42 4.37	23 42 21.7	8.6	8.3	0.61
18	2 6.7	3 52 59.55	21 16 34.5	6.7	6.4	0.46	3	2 59.1	7 46 54.62	23 30 22.2	8.7	8.4	0.61
19	2 7.7	3 57 59.78	21 34 11.1	6.7	6.5	0.46	4	3 0.0	7 51 43.29	23 17 47.7	8.8	8.5	0.61
20	2 8.8	4 3 0.93	21 51 13.6	6.7	6.5	0.47	5	3 0.8	7 56 30.32	23 4 38.6	8.8	8.5	0.62
21	2 9.8	4 8 2.98	+22 7 41.3	6.8	6.5	0.47	6	3 1.6	8 1 15.67	+22 50 55.6	8.9	8.6	0.62
22	2 10.9	4 13 5.89	22 23 33.6	6.8	6.6	0.47	7	3 2.4	8 5 59.31	22 36 39.4	9.0	8.7	0.63
23	2 12.0	4 18 9.64	22 38 49.9	6.8	6.6	0.47	8	3 3.1	8 10 41.21	22 21 50 6	9.0	8.8	0.63
24	2 13.1	4 23 14.19	22 53 29.9	6.9	6.6	0.48	9	3 3.8	8 15 21.34	22 6 29.8	9.1	8.8	0.63
25	2 14.2	4 28 19.50	23 7 32.8	6.9	6.6	0.48	10	3 4.5	8 19 59.66	21 50 37.5	9.2	8.9	0.64
26	2 15.4	4 33 25.53	+23 20 58.0	6.9	6.7	0.48	11	3 5.2	8 24 36.14	+21 34 14.6	9.3	9.0	0.64
27	2 16.6	4 38 32.25	23 33 45.2	7.0	6.7	0.49	12	3 5.8	8 29 10.77	21 17 21.7	9.3	9.0	0.65
28	2 17.9	4 43 39.61	23 45 54.0	7.0	6.7	0.49	13	3 6.4	8 33 43.52	20 59 59.6	9.4	9.1	0.65
29	2 19.1	4 48 47.55	23 57 23.9	7.0	6.8	0.49	14	3 7.0	8 38 14.37	20 42 8.9	9.5	9.2	0.65
30	2 20.4	4 53 56.03	24 8 14.5	7.1	6.8	0.50	15	3 7.5	8 42 43.30	20 23 50.3	9.6	9.3	0.66
May 1	2 21.6	4 59 5.01	+24 18 25.4	7.1	6.8	0.50	16	3 8.0	8 47 10.29	+20 5 4.5	9.7	9.3	0.66
2	2 22.8	5 4 14.41	24 27 56.3	7.1	6.9	0.50	17	3 8.5	8 51 35.32	19 45 52.3	9.8	9.4	0.67
3	2 24.0	5 9 24.18	24 36 46.8	7.2	6.9	0.51	18	3 9.0	8 55 58.37	19 26 14.3	9.9	9.5	0.67
4	2 25.2	5 14 34.28	24 44 56.5	7.2	6.9	0.51	19	3 9.4	9 0 19.42	19 6 11.4	9.9	9.6	0.68
5	2 26.4	5 19 44.64	24 52 25.1	7.2	7.0	0.51	20	3 9.8	9 4 38.45	18 45 44.3	10.0	9.7	0.68
6	2 27.7	5 24 55.21	+24 59 12.6	7.3	7.0	0.52	21	3 10.2	9 8 55.46	+18 24 53.7	10.1	9.8	0.69
7	2 28.9	5 30 5.92	25 5 18.7	7.3	7.1	0.52	22	3 10.5	9 13 10.43	18 3 40.5	10.2	9.9	0.69
8	2 30.1	5 35 16.70	25 10 43.2	7.3	7.1	0.52	23	3 10.7	9 17 23.32	17 42 5.3	10.3	10.0	0.70
9	2 31.3	5 40 27.51	25 15 26.0	7.4	7.1	0.53	24	3 10.9	9 21 34.12	17 20 8.7	10.4	10.0	0.70
10	2 32.6	5 45 38.29	25 19 26.8	7.4	7.2	0.53	25	3 11.1	9 25 42.82	16 57 51.7	10.5	10.1	0.71
11	2 33.8	5 50 48.95	+25 22 45.6	7.5	7.2	0.53	26	3 11.3	9 29 49.40	+16 35 15.0	10.6	10.2	0.71
12	2 35.0	5 55 59.46	25 25 22.5	7.5	7.3	0.54	27	3 11.4	9 33 53.84	16 12 19.1	10.7	10.3	0.72
13	2 36.2	6 1 9.73	25 27 17.3	7.5	7.3	0.54	28	3 11.5	9 37 56.14	15 49 5.7	10.8	10.4	0.73
14	2 37.5	6 6 19.70	25 28 30.0	7.6	7.4	0.54	29	3 11.6	9 41 56.27	15 25 34.7	10.9	10.5	0.73
15	2 38.7	6 11 29.32	25 29 0.8	7.6	7.4	0.55	30	3 11.6	9 45 54.22	15 1 47.2	11.0	10.6	0.74
16	2 39.8	6 16 38.50	+25 28 49.7	7.7	7.4	0.55	31	3 11.5	9 49 49.97	+14 37 43.9	11.1	10.8	0.74
17	2 41.0	6 21 47.19	+25 27 56.8	7.7	7.5	0.55	32	3 11.5	9 53 43.51	+14 13 25.7	11.3	10.9	0.75

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	3 11.5	9 49 49.97	+14 37 43.9	11.1	10.8	0.74	Aug. 16	2 23.2	12 2 41.02	- 4 44 7.6	20.3	19.6	1.31
2	3 11.5	9 53 43.51	14 13 25.7	11.3	10.9	0.75	17	2 20.7	12 4 5.65	5 4 43.9	20.7	20.0	1.34
3	3 11.4	9 57 34.83	13 48 53.1	11.4	11.0	0.75	18	2 18.0	12 5 24.46	5 24 48.3	21.0	20.3	1.36
4	3 11.3	10 1 23.92	13 24 6.9	11.5	11.1	0.76	19	2 15.3	12 6 37.25	5 44 19.2	21.3	20.6	1.38
5	3 11.1	10 5 10.77	12 59 8.1	11.6	11.2	0.77	20	2 12.5	12 7 43.81	6 3 14.5	21.7	20.9	1.40
6	3 10.9	10 8 55.37	+12 33 57.3	11.7	11.3	0.77	21	2 9.6	12 8 43.94	- 6 21 32.1	22.0	21.3	1.43
7	3 10.7	10 12 37.72	12 8 35.2	11.9	11.4	0.78	22	2 6.6	12 9 37.44	6 39 9.8	22.4	21.6	1.45
8	3 10.4	10 16 17.81	11 43 2.6	12.0	11.6	0.79	23	2 3.4	12 10 24.07	6 56 5.3	22.7	22.0	1.48
9	3 10.1	10 19 55.62	11 17 20.3	12.1	11.7	0.80	24	2 0.1	12 11 3.63	7 12 16.1	23.1	22.3	1.50
10	3 9.8	10 23 31.13	10 51 29.1	12.3	11.8	0.80	25	1 56.7	12 11 35.92	7 27 40.0	23.5	22.7	1.53
11	3 9.5	10 27 4.32	+10 25 29.6	12.4	12.0	0.81	26	1 53 2	12 12 0.75	- 7 42 14.4	23.9	23.0	1.55
12	3 9.1	10 30 35.17	9 59 22.7	12.6	12.1	0.82	27	1 49.5	12 12 17.94	7 55 56.7	24.3	23.4	1.58
13	3 8.6	10 34 3.68	9 33 9.0	12.7	12.3	0.83	28	1 45.8	12 12 27.33	8 8 44.3	24.6	23.8	1.60
14	3 8.1	10 37 29.83	9 6 49.2	12.9	12.4	0.84	29	1 41.9	12 12 28.76	8 20 34.4	25.0	24.1	1.63
15	3 7.5	10 40 53.60	8 40 24.3	13.0	12.6	0.85	30	1 37.8	12 12 22.10	8 31 24.3	25.4	24.5	1.66
16	3 6.9	10 44 14.95	+ 8 13 55.0	13.2	12.7	0.86	31	1 33.6	12 12 7.24	- 8 41 11.1	25.8	24.9	1.68
17	3 6.3	10 47 33.86	7 47 21.8	13.3	12.9	0.87	Sept. 1	1 29.3	12 11 44.10	8 49 52.0	26.2	25.3	1.71
18	3 5.6	10 50 50.29	7 20 45.7	13.5	13.0	0.88	2	1 24.8	12 11 12.64	8 57 24.3	26.6	25.7	1.73
19	3 4.9	10 54 4.20	6 54 7.6	13.6	13.2	0.89	3	1 20.2	12 10 32.87	9 3 45.4	27.0	26.0	1.76
20	3 4.1	10 57 15.55	6 27 28.2	13.8	13.3	0.89	4	1 15.5	12 9 44.84	9 8 53.0	27.3	26.4	1.78
21	3 3.3	11 0 24.29	+ 6 0 48.2	14.0	13.5	0.90	5	1 10.7	12 8 48.64	- 9 12 44.7	27.7	26.7	1.81
22	3 2.5	11 3 30.38	5 34 8.5	14.2	13.6	0.92	6	1 5.7	12 7 44.42	9 15 18.2	28.0	27.1	1.83
23	3 1.6	11 6 33.77	5 7 30.1	14.3	13.8	0.93	7	1 0.6	12 6 32.37	9 16 31.5	28.4	27.4	1.86
24	3 0.7	11 9 34.39	4 40 53.7	14.5	14.0	0.94	8	0 55.3	12 5 12.74	9 16 23.0	28.8	27.8	1.88
25	2 59.7	11 12 32.15	4 14 20.2	14.7	14.2	0.95	9	0 49.9	12 3 45.84	9 14 51.6	29.2	28.1	1.90
26	2 58.7	11 15 26.99	+ 3 47 50.4	14.9	14.4	0.96	10	0 44.4	12 2 12.04	- 9 11 56.3	29.5	28.4	1.92
27	2 57.6	11 18 18.87	3 21 25.5	15.1	14.6	0.98	11	0 38.8	12 0 31.75	9 7 36.5	29.8	28.6	1.94
28	2 56.5	11 21 7.70	2 55 6.3	15.4	14.8	0.99	12	0 33.1	11 58 45.44	9 1 52.0	30.1	28.9	1.95
29	2 55.3	11 23 53.39	2 28 53.5	15.6	15.0	1.00	13	0 27.3	11 56 53.66	8 54 43.9	30.3	29.2	1.97
30	2 54.0	11 26 35.86	2 2 48.2	15.8	15.2	1.01	14	0 21.4	11 54 57.02	8 46 13.0	30.6	29.4	1.99
31	2 52.7	11 29 15.02	+ 1 36 51.5	16.1	15.4	1.03	15	0 15.5	11 52 56.17	- 8 36 21.1	30.8	29.6	2.00
Aug. 1	2 51.4	11 31 50.76	1 11 4.3	16.3	15.6	1.04	16	0 9.5	11 50 51.83	8 25 10.5	31.0	29.8	2.01
2	2 50.0	11 34 22.99	0 45 27.7	16.5	15.9	1.06	17	0 3.5	11 48 44.72	8 12 44.3	31.1	30.0	2.02
3	2 48.5	11 36 51.61	+ 0 20 2.6	16.7	16.1	1.07	17	23 57.4	11 46 35.62	7 59 6.1	31.2	30.2	2.03
4	2 47.0	11 39 16.53	- 0 5 9.9	16.9	16.3	1.09	18	23 51.3	11 44 25.32	7 44 20.1	31.3	30.3	2.03
5	2 45.4	11 41 37.65	- 0 30 8.7	17.2	16.6	1.10	19	23 45.2	11 42 14.65	- 7 28 31.0	31.3	30.3	2.04
6	2 43.7	11 43 54.84	0 54 52.6	17.4	16.8	1.12	20	23 39.1	11 40 4.46	7 11 44.3	31.4	30.4	2.04
7	2 42.0	11 46 7.97	1 19 20.7	17.7	17.1	1.14	21	23 33.0	11 37 55.58	6 54 5.9	31.4	30.4	2.04
8	2 40.3	11 48 16.93	1 43 31.6	18.0	17.3	1.16	22	23 26.9	11 35 48.85	6 35 42.1	31.4	30.4	2.04
9	2 38.5	11 50 21.58	2 7 24.2	18.2	17.6	1.17	23	23 20.9	11 33 45.09	6 16 39.8	31.4	30.3	2.03
10	2 36.6	11 52 21.79	- 2 30 57.1	18.5	17.9	1.19	24	23 15.0	11 31 45.12	- 5 57 5.9	31.3	30.3	2.03
11	2 34.6	11 54 17.40	2 54 9.2	18.8	18.2	1.21	25	23 9.1	11 29 49.69	5 37 7.6	31.2	30.2	2.02
12	2 32.5	11 56 8.26	3 16 59.0	19.1	18.5	1.23	26	23 3.4	11 27 59.49	5 16 52.0	31.1	30.0	2.01
13	2 30.2	11 57 54.22	3 39 25.3	19.4	18.7	1.25	27	22 57.8	11 26 15.19	4 56 26.3	30.9	29 8	1.99
14	2 27.9	11 59 35.12	4 1 26.6	19.7	19.0	1.27	28	22 52.3	11 24 37.43	4 35 57.6	30.6	29.6	1.98
15	2 25.6	12 1 10.78	- 4 23 1.3	20.0	19.3	1.29	29	22 46.9	11 23 6.75	- 4 15 33.1	30.4	29.3	1.96
16	2 23.2	12 2 41.02	- 4 44 7.6	20.3	19.6	1.31	30	22 41.5	11 21 43.63	- 3 55 19.2	30.1	29.1	1.94

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	22 36.3	11 20 28.49	− 3 35 22.4	29.9	28.9	1.93	Nov. 16	20 49.6	12 34 50.76	− 2 38 14.7	15.5	15.0	1.00
2	22 31.3	11 19 21.71	3 15 48.6	29.6	28.6	1.91	17	20 49.1	12 38 15.68	2 53 26.9	15.3	14.8	0.99
3	22 26.4	11 18 23.58	2 56 43.4	29.3	28.3	1.89	18	20 48.6	12 41 42.89	3 9 3.5	15.1	14.6	0.98
4	22 21.6	11 17 34.32	2 38 11.6	29.0	28.0	1.87	19	20 48.1	12 45 12.34	3 25 3.4	14.9	14.5	0.96
5	22 17.0	11 16 54.08	2 20 17.7	28.6	27.6	1.84	20	20 47.7	12 48 43.98	3 41 25.7	14.8	14.3	0.95
6	22 12.6	11 16 22.98	− 2 3 5.7	28.3	27.3	1.82	21	20 47.3	12 52 17.74	− 3 58 9.2	14.6	14.1	0.94
7	22 8.3	11 16 1.06	1 46 39.3	28.0	27.0	1.80	22	20 47.0	12 55 53.55	4 15 12.8	14.4	13.9	0.93
8	22 4.2	11 15 48.30	1 31 1.5	27.6	26.7	1.78	23	20 46.7	12 59 31.36	4 32 35.5	14.2	13.7	0.92
9	22 0.2	11 15 44.66	1 16 14.8	27.2	26.3	1.75	24	20 46.5	13 3 11.12	4 50 16.2	14.1	13.6	0.91
10	21 56.3	11 15 50.07	1 2 21.2	26.9	26.0	1.73	25	20 46.3	13 6 52.80	5 8 13.8	13.9	13.4	0.90
11	21 52.7	11 16 4.42	− 0 49 22.5	26.5	25.6	1.70	26	20 46.1	13 10 36.38	− 5 26 27.4	13.7	13.3	0.89
12	21 49.1	11 16 27.55	0 37 20.0	26.1	25.2	1.68	27	20 45.9	13 14 21.81	5 44 55.9	13.6	13.2	0.88
13	21 45.7	11 16 59.28	0 26 14.6	25.7	24.8	1.66	28	20 45.7	13 18 9.06	6 3 38.3	13.4	13.0	0.87
14	21 42.6	11 17 39.42	0 16 7.0	25.3	24.5	1.63	29	20 45.6	13 21 58.10	6 22 33.5	13.3	12.9	0.86
15	21 39.4	11 18 27.76	− 0 6 57.6	24.9	24.1	1.61	30	20 45.5	13 25 48.91	6 41 40.6	13.1	12.7	0.85
16	21 36.3	11 19 24.08	+ 0 1 13.3	24.6	23.7	1.58	Dec. 1	20 45.4	13 29 41.46	− 7 0 58.5	13.0	12.5	0.84
17	21 33.4	11 20 28.14	0 8 25.9	24.2	23.4	1.56	2	20 45.3	13 33 35.73	7 20 26.2	12.8	12.4	0.83
18	21 30.6	11 21 39.71	0 14 40.4	23.8	23.0	1.54	3	20 45.3	13 37 31.69	7 40 2.7	12.7	12.3	0.82
19	21 28.0	11 22 58.57	0 19 57.3	23.5	22.7	1.51	4	20 45.4	13 41 29.33	7 59 47.1	12.6	12.1	0.82
20	21 25.5	11 24 24.46	0 24 17.1	23.1	22.3	1.49	5	20 45.4	13 45 28.61	8 19 38.3	12.4	12.0	0.81
21	21 23.1	11 25 57.14	+ 0 27 40.4	22.8	22.0	1.46	6	20 45.5	13 49 29.53	− 8 39 35.2	12.3	11.9	0.80
22	21 20.9	11 27 36.39	0 30 7.9	22.4	21.6	1.44	7	20 45.6	13 53 32.05	8 59 36.9	12.2	11.8	0.79
23	21 18.7	11 29 21.98	0 31 40.5	22.0	21.3	1.42	8	20 45.7	13 57 36.15	9 19 42.3	12.1	11.7	0.78
24	21 16.6	11 31 13.67	0 32 19.3	21.7	21.0	1.40	9	20 45.8	14 1 41.83	9 39 50.4	11.9	11.5	0.77
25	21 14.6	11 33 11.25	0 32 5.2	21.4	20.7	1.37	10	20 45.9	14 5 49.07	10 0 0.3	11.8	11.4	0.77
26	21 12.7	11 35 14.50	+ 0 30 59.1	21.0	20.3	1.35	11	20 46.1	14 9 57.86	−10 20 10.9	11.7	11.3	0.76
27	21 10.9	11 37 23.21	0 29 2.0	20.7	20.0	1.33	12	20 46.4	14 14 8.19	10 40 21.2	11.6	11.2	0.76
28	21 9.3	11 39 37.17	0 26 15.0	20.4	19.7	1.31	13	20 46.7	14 18 20.04	11 0 30.1	11.5	11.1	0.75
29	21 7.7	11 41 56.19	0 22 39.2	20.1	19.4	1.29	14	20 47.0	14 22 33.40	11 20 36.8	11.4	11.0	0.74
30	21 6.1	11 44 20.08	0 18 15.7	19.8	19.1	1.27	15	20 47.3	14 26 48.26	11 40 40.2	11.2	10.9	0.74
31	21 4.6	11 46 48.66	+ 0 13 5.8	19.5	18.8	1.26	16	20 47.6	14 31 4.63	−12 0 39.5	11.1	10.7	0.73
Nov. 1	21 3.1	11 49 21.74	0 7 10.6	19.2	18.5	1.24	17	20 48.0	14 35 22.49	12 20 33.7	11.0	10.6	0.73
2	21 1.9	11 51 59.14	+ 0 0 31.3	18.9	18.3	1.22	18	20 48.4	14 39 41.83	12 40 21.7	10.9	10.5	0.72
3	21 0.7	11 54 40.68	− 0 6 50.9	18.7	18.0	1.20	19	20 48.8	14 44 2.64	13 0 2.7	10.8	10.4	0.72
4	20 59.5	11 57 26.21	0 14 54.7	18.4	17.7	1.19	20	20 49.2	14 48 24.94	13 19 35.8	10.7	10.4	0.71
5	20 58.4	12 0 15.58	− 0 23 38.9	18.1	17.5	1.17	21	20 49.6	14 52 48.71	−13 39 0.0	10.6	10.3	0.71
6	20 57.3	12 3 8.61	0 33 2.3	17.8	17.2	1.15	22	20 50.1	14 57 13.97	13 58 14.4	10.5	10.2	0.70
7	20 56.3	12 6 5.15	0 43 3.6	17.6	17.0	1.14	23	20 50.6	15 1 40.71	14 17 18.1	10.4	10.1	0.70
8	20 55.3	12 9 5.06	0 53 41.5	17.3	16.8	1.12	24	20 51.1	15 6 8.94	14 36 10.2	10.4	10.0	0.69
9	20 54.4	12 12 8.21	1 4 54.8	17.1	16.5	1.10	25	20 51.6	15 10 38.64	14 54 49.9	10.3	9.9	0.68
10	20 53.6	12 15 14.46	− 1 16 42.4	16.8	16.3	1.09	26	20 52.2	15 15 9.82	−15 13 16.2	10.2	9.8	0.68
11	20 52.9	12 18 23.69	1 29 2.8	16.6	16.0	1.07	27	20 52.8	15 19 42.49	15 31 28.2	10.1	9.7	0.67
12	20 52.2	12 21 35.79	1 41 54.7	16.4	15.8	1.06	28	20 53.4	15 24 16.63	15 49 25.2	10.0	9.7	0.67
13	20 51.5	12 24 50.65	1 55 17.1	16.2	15.6	1.04	29	20 54.1	15 28 52.24	16 7 6.3	9.9	9.6	0.67
14	20 50.8	12 28 8.15	2 9 8.7	16.0	15.4	1.03	30	20 54.8	15 33 29.30	16 24 30.4	9.8	9.5	0.66
15	20 50.2	12 31 28.22	− 2 23 28.3	15.8	15.2	1.02	31	20 55.5	15 38 7.83	−16 41 36.8	9.8	9.4	0.66
16	20 49.6	12 34 50.76	− 2 38 14.7	15.5	15.0	1.00	32	20 56.2	15 42 47.82	−16 58 24.7	9.7	9.3	0.65

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	20 58.5	9 42 20.66	+15 8 59.1	4.1	2.3	0.16	Nov. 16	19 40.1	11 25 6.06	+5 36 26.5	4.9	2.8	0.19
2	20 56.9	9 44 44.34	14 57 25.1	4.1	2.3	0.16	17	19 38.2	11 27 10.38	5 23 45.9	4.9	2.8	0.19
3	20 55.4	9 47 7.58	14 45 47.0	4.1	2.4	0.16	18	19 36.3	11 29 14.28	5 11 6.6	4.9	2.8	0.19
4	20 53.8	9 49 30.37	14 34 4.9	4.1	2.4	0.16	19	19 34.4	11 31 17.76	4 58 28.6	4.9	2.8	0.19
5	20 52.2	9 51 52.72	14 22 19.0	4.1	2.4	0.16	20	19 32.6	11 33 20.81	4 45 52.1	5.0	2.8	0.19
6	20 50.7	9 54 14.63	+14 10 29.3	4.2	2.4	0.16	21	19 30.7	11 35 23.43	+4 33 17.2	5.0	2.9	0.19
7	20 49.1	9 56 36.11	13 58 36.0	4.2	2.4	0.16	22	19 28.8	11 37 25.64	4 20 44.0	5.0	2.9	0.19
8	20 47.5	9 58 57.14	13 46 39.3	4.2	2.4	0.16	23	19 26.9	11 39 27.42	4 8 12.5	5.0	2.9	0.19
9	20 45.9	10 1 17.74	13 34 39.2	4.2	2.4	0.16	24	19 24.9	11 41 28.78	3 55 42.9	5.1	2.9	0.19
10	20 44.3	10 3 37.90	13 22 35.8	4.2	2.4	0.16	25	19 23.0	11 43 29.72	3 43 15.3	5.1	2.9	0.19
11	20 42.7	10 5 57.63	+13 10 29.3	4.2	2.4	0.16	26	19 21.1	11 45 30.24	+3 30 49.7	5.1	2.9	0.20
12	20 41.1	10 8 16.91	12 58 19.8	4.2	2.4	0.17	27	19 19.1	11 47 30.33	3 18 26.3	5.1	2.9	0.20
13	20 39.5	10 10 35.76	12 46 7.4	4.3	2.4	0.17	28	19 17.2	11 49 30.00	3 6 5.1	5.2	3.0	0.20
14	20 37.8	10 12 54.17	12 33 52.3	4.3	2.4	0.17	29	19 15.3	11 51 29.24	2 53 46.3	5.2	3.0	0.20
15	20 36.2	10 15 12.14	12 21 34.6	4.3	2.4	0.17	30	19 13.3	11 53 28.06	2 41 30.0	5.2	3.0	0.20
16	20 34.5	10 17 29.67	+12 9 14.4	4.3	2.5	0.17	Dec. 1	19 11.4	11 55 26.44	+2 29 16.2	5.3	3.0	0.20
17	20 32.9	10 19 46.77	11 56 51.8	4.3	2.5	0.17	2	19 9.4	11 57 24.39	2 17 5.1	5.3	3.0	0.20
18	20 31.2	10 22 3.43	11 44 27.0	4.3	2.5	0.17	3	19 7.4	11 59 21.90	2 4 56.7	5.3	3.0	0.20
19	20 29.5	10 24 19.65	11 32 0.1	4.3	2.5	0.17	4	19 5.4	12 1 18.96	1 52 51.3	5.3	3.0	0.20
20	20 27.9	10 26 35.44	11 19 31.1	4.4	2.5	0.17	5	19 3.4	12 3 15.57	1 40 48.8	5.4	3.1	0.21
21	20 26.2	10 28 50.81	+11 7 0.2	4.4	2.5	0.17	6	19 1.4	12 5 11.72	+1 28 49.4	5.4	3.1	0.21
22	20 24.5	10 31 5.74	10 54 27.5	4.4	2.5	0.17	7	18 59.4	12 7 7.40	1 16 53.2	5.4	3.1	0.21
23	20 22.8	10 33 20.24	10 41 53.2	4.4	2.5	0.17	8	18 57.4	12 9 2.61	1 5 0.5	5.5	3.1	0.21
24	20 21.1	10 35 34.31	10 29 17.3	4.4	2.5	0.17	9	18 55.4	12 10 57.33	0 53 11.2	5.5	3.1	0.21
25	20 19.4	10 37 47.97	10 16 39.9	4.4	2.5	0.17	10	18 53.3	12 12 51.55	0 41 25.5	5.5	3.2	0.21
26	20 17.7	10 40 1.21	+10 4 1.2	4.4	2.5	0.17	11	18 51.3	12 14 45.28	+0 29 43.6	5.6	3.2	0.21
27	20 16.0	10 42 14.04	9 51 21.2	4.5	2.6	0.17	12	18 49.2	12 16 38.49	0 18 5.5	5.6	3.2	0.21
28	20 14.2	10 44 26.45	9 38 40.1	4.5	2.6	0.17	13	18 47.2	12 18 31.19	+0 6 31.4	5.6	3.2	0.22
29	20 12.5	10 46 38.46	9 25 57.9	4.5	2.6	0.17	14	18 45.1	12 20 23.36	−0 4 58.7	5.7	3.2	0.22
30	20 10.7	10 48 50.07	9 13 14.8	4.5	2.6	0.17	15	18 43.0	12 22 14.99	0 16 24.5	5.7	3.3	0.22
31	20 9.0	10 51 1.27	+ 9 0 30.9	4.5	2.6	0.17	16	18 40.9	12 24 6.07	−0 27 46.1	5.7	3.3	0.22
Nov. 1	20 7.2	10 53 12.07	8 47 46.2	4.6	2.6	0.18	17	18 38.8	12 25 56.60	0 39 3.2	5.8	3.3	0.22
2	20 5.5	10 55 22.48	8 35 0.9	4.6	2.6	0.18	18	18 36.7	12 27 46.57	0 50 15.8	5.8	3.3	0.22
3	20 3.7	10 57 32.49	8 22 15.1	4.6	2.6	0.18	19	18 34.6	12 29 35.97	1 1 23.8	5.8	3.3	0.22
4	20 1.9	10 59 42.10	8 9 28.9	4.6	2.6	0.18	20	18 32.5	12 31 24.80	1 12 27.1	5.9	3.4	0.22
5	20 0.1	11 1 51.32	+ 7 56 42.5	4.6	2.6	0.18	21	18 30.4	12 33 13.04	−1 23 25.6	5.9	3.4	0.23
6	19 58.3	11 4 0.14	7 43 55.8	4.7	2.7	0.18	22	18 28.2	12 35 0.68	1 34 19.2	6.0	3.4	0.23
7	19 56.5	11 6 8.56	7 31 9.1	4.7	2.7	0.18	23	18 26.1	12 36 47.72	1 45 7.7	6.0	3.4	0.23
8	19 54.7	11 8 16.59	7 18 22.5	4.7	2.7	0.18	24	18 23.9	12 38 34.16	1 55 51.1	6.1	3.4	0.23
9	19 52.9	11 10 24.21	7 5 36.1	4.7	2.7	0.18	25	18 21.7	12 40 19.98	2 6 29.4	6.1	3.5	0.23
10	19 51.1	11 12 31.42	+ 6 52 49.9	4.7	2.7	0.18	26	18 19.6	12 42 5.18	−2 17 2.4	6.1	3.5	0.23
11	19 49.3	11 14 38.23	6 40 4.2	4.8	2.7	0.18	27	18 17.4	12 43 49.74	2 27 30.0	6.2	3.5	0.23
12	19 47.5	11 16 44.62	6 27 19.1	4.8	2.7	0.18	28	18 15.2	12 45 33.65	2 37 52.1	6.2	3.5	0.24
13	19 45.6	11 18 50.61	6 14 34.6	4.8	2.7	0.18	29	18 13.0	12 47 16.89	2 48 8.7	6.3	3.6	0.24
14	19 43 8	11 20 56.18	6 1 51.0	4.8	2.8	0.18	30	18 10.7	12 48 59.46	2 58 19.6	6.3	3.6	0.24
15	19 41.9	11 23 1.33	+ 5 49 8.3	4.8	2.8	0.18	31	18 8.5	12 50 41.34	−3 8 24.6	6.4	3.6	0.24
16	19 40.1	11 25 6.06	+ 5 36 26.5	4.9	2.8	0.19	32	18 6.2	12 52 22.51	−3 28 23.8	6.4	3.7	0.24

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Feb. 1	17 25.0	14 14 14.42	−12 5 35.9	1.7	18.0	1.30	Mar. 18	14 25.6	14 11 43.84	−11 43 16.7	1.9	20.4	1.48
2	17 21.3	14 14 26.64	12 6 25.5	1.7	18.0	1.31	19	14 21.3	14 11 24.92	11 41 29.2	1.9	20.4	1.48
3	17 17.6	14 14 38.18	12 7 11.5	1.7	18.1	1.31	20	14 17.1	14 11 5.43	11 39 38.8	1.9	20.5	1.49
4	17 13.8	14 14 49.04	12 7 53.8	1.7	18.1	1.32	21	14 12.8	14 10 45.38	11 37 45.7	1.9	20.5	1.49
5	17 10.0	14 14 59.20	12 8 32.5	1.7	18.2	1.32	22	14 8.5	14 10 24.78	11 35 49.8	1.9	20.5	1.49
6	17 6.3	14 15 8.67	−12 9 7.7	1.7	18.2	1.32	23	14 4.3	14 10 3.64	−11 33 51.3	1.9	20.6	1.49
7	17 2.5	14 15 17.44	12 9 39.2	1.7	18.3	1.33	24	14 0.0	14 9 41.98	11 31 50.3	1.9	20.6	1.50
8	16 58.7	14 15 25.51	12 10 7.1	1.7	18.3	1.33	25	13 55.7	14 9 19.82	11 29 46.8	1.9	20.7	1.50
9	16 54.9	14 15 32.88	12 10 31.3	1.7	18.4	1.34	26	13 51.4	14 8 57.17	11 27 40.8	1.9	20.7	1.50
10	16 51.1	14 15 39.54	12 10 51.9	1.7	18.4	1.34	27	13 47.1	14 8 34.04	11 25 32.5	1.9	20.7	1.50
11	16 47.2	14 15 45.49	−12 11 8.8	1.7	18.5	1.34	28	13 42.7	14 8 10.46	−11 23 21.9	1.9	20.8	1.50
12	16 43.4	14 15 50.72	12 11 22.0	1.8	18.5	1.35	29	13 38.4	14 7 46.43	11 21 9.2	1.9	20.8	1.51
13	16 39.5	14 15 55.23	12 11 31.6	1.8	18.6	1.35	30	13 34.1	14 7 21.98	11 18 54.4	2.0	20.8	1.51
14	16 35.7	14 15 59.02	12 11 37.5	1.8	18.6	1.36	31	13 29.7	14 6 57.12	11 16 37.5	2.0	20.9	1.51
15	16 31.8	14 16 2.08	12 11 39.7	1.8	18.7	1.36	Apr. 1	13 25.4	14 6 31.86	11 14 18.7	2.0	20.9	1.51
16	16 27.9	14 16 4.42	−12 11 38.2	1.8	18.8	1.37	2	13 21.0	14 6 6.24	−11 11 58.1	2.0	20.9	1.51
17	16 24.0	14 16 6.03	12 11 33.0	1.8	18.9	1.37	3	13 16.7	14 5 40.26	11 9 35.8	2.0	20.9	1.52
18	16 20.1	14 16 6.91	12 11 24.2	1.8	18.9	1.37	4	13 12.3	14 5 13.94	11 7 11.8	2.0	21.0	1.52
19	16 16.1	14 16 7.06	12 11 11.6	1.8	19.0	1.38	5	13 7.9	14 4 47.29	11 4 46.3	2.0	21.0	1.52
20	16 12.2	14 16 6.47	12 10 55.3	1.8	19.0	1.38	6	13 3.5	14 4 20.35	11 2 19.4	2.0	21.0	1.52
21	16 8.2	14 16 5.15	−12 10 35.4	1.8	19.1	1.39	7	12 59.1	14 3 53.12	−10 59 51.0	2.0	21.0	1.52
22	16 4.3	14 16 3.10	12 10 11.7	1.8	19.1	1.39	8	12 54.7	14 3 25.62	10 57 21.4	2.0	21.1	1.52
23	16 0.3	14 16 0.32	12 9 44.4	1.8	19.2	1.39	9	12 50.3	14 2 57.86	10 54 50.6	2.0	21.1	1.52
24	15 56.3	14 15 56.81	12 9 13.4	1.8	19.3	1.40	10	12 45.9	14 2 29.88	10 52 18.8	2.0	21.1	1.52
25	15 52.3	14 15 52.57	12 8 38.8	1.8	19.3	1.40	11	12 41.5	14 2 1.68	10 49 46.0	2.0	21.1	1.53
26	15 48.3	14 15 47.61	−12 8 0.6	1.8	19.4	1.41	12	12 37.2	14 1 33.29	−10 47 12.2	2.0	21.1	1.53
27	15 44.2	14 15 41.93	12 7 18.8	1.8	19.4	1.41	13	12 32.8	14 1 4.72	10 44 37.7	2.0	21.1	1.53
28	15 40.2	14 15 35.53	12 6 33.4	1.8	19.5	1.42	14	12 28.4	14 0 36.00	10 42 2.5	2.0	21.2	1.53
Mar. 1	15 36.2	14 15 28.42	12 5 44.4	1.8	19.5	1.42	15	12 24.0	14 0 7.14	10 39 26.8	2.0	21.2	1.53
2	15 32.1	14 15 20.60	12 4 51.9	1.8	19.6	1.42	16	12 19.5	13 59 38.16	10 36 50.6	2.0	21.2	1.53
3	15 28.0	14 15 12.08	−12 3 55.9	1.8	19.6	1.43	17	12 15.1	13 59 9.09	−10 34 14.0	2.0	21.2	1.53
4	15 23.9	14 15 2.86	12 2 56.4	1.8	19.7	1.43	18	12 10.7	13 58 39.94	10 31 37.1	2.0	21.2	1.53
5	15 19.9	14 14 52.94	12 1 53.5	1.8	19.7	1.43	19	12 6.3	13 58 10.73	10 29 0.2	2.0	21.2	1.53
6	15 15.8	14 14 42.34	12 0 47.1	1.9	19.8	1.44	20	12 1.8	13 57 41.49	10 26 23.3	2.0	21.2	1.53
7	15 11.6	14 14 31.05	11 59 37.3	1.9	19.8	1.44	21	11 57.4	13 57 12.24	10 23 46.4	2.0	21.2	1.53
8	15 7.5	14 14 19.10	−11 58 24.3	1.9	19.9	1.44	22	11 53.0	13 56 43.00	−10 21 9.7	2.0	21.2	1.53
9	15 3.4	14 14 6.47	11 57 7.9	1.9	19.9	1.45	23	11 48.6	13 56 13.80	10 18 33.4	2.0	21.2	1.53
10	14 59.2	14 13 53.18	11 55 48.2	1.9	20.0	1.45	24	11 44.2	13 55 44.64	10 15 57.5	2.0	21.2	1.53
11	14 55.0	14 13 39.23	11 54 25.2	1.9	20.0	1.45	25	11 39.7	13 55 15.56	10 13 22.1	2.0	21.2	1.53
12	14 50.8	14 13 24.63	11 52 59.0	1.9	20.1	1.46	26	11 35.3	13 54 46.57	10 10 47.5	2.0	21.2	1.53
13	14 46.7	14 13 9.39	−11 51 29.6	1.9	20.1	1.46	27	11 30.9	13 54 17.70	−10 8 13.6	2.0	21.2	1.53
14	14 42.5	14 12 53.51	11 49 57.1	1.9	20.2	1.46	28	11 26.5	13 53 48.96	10 5 40.6	2.0	21.2	1.53
15	14 38.3	14 12 37.01	11 48 21.5	1.9	20.2	1.47	29	11 22.1	13 53 20.38	10 3 8.7	2.0	21.2	1.53
16	14 34.0	14 12 19.89	11 46 42.9	1.9	20.3	1.47	30	11 17.7	13 52 51.96	10 0 37.8	2.0	21.2	1.53
17	14 29.8	14 12 2.16	11 45 1.3	1.9	20.3	1.47	May 1	11 13.3	13 52 23.74	9 58 8.1	2.0	21.2	1.52
18	14 25.6	14 11 43.84	−11 43 16.7	1.9	20.4	1.48	2	11 8.9	13 51 55.73	− 9 55 39.9	2.0	21.2	1.52
19	14 21.3	14 11 24.92	−11 41 29.2	1.9	20.4	1.48	3	11 4.5	13 51 27.95	− 9 53 13.1	2.0	21.1	1.52

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
May 1	11 13.3	13 52 23.74	−9 58 8.1	2.0	21.2	1.52	June 16	7 58.6	13 38 28.87	−8 49 45.9	1.8	19.4	1.40
2	11 8.9	13 51 55.73	9 55 39.9	2.0	21.1	1.52	17	7 54.6	13 38 24.60	8 49 38.7	1.8	19.4	1.39
3	11 4.5	13 51 27.95	9 53 13.1	2.0	21.1	1.52	18	7 50.6	13 38 21.00	8 49 35.4	1.8	19.3	1.39
4	11 0.1	13 51 0.42	9 50 47.8	2.0	21.1	1.52	19	7 46.6	13 38 18.08	8 49 36.0	1.8	19.3	1.39
5	10 55.7	13 50 33.15	9 48 24.1	2.0	21.1	1.52	20	7 42.6	13 38 15.84	8 49 40.6	1.8	19.2	1.38
6	10 51.3	13 50 6.17	−9 46 2.2	2.0	21.1	1.52	21	7 38.7	13 38 14.29	−8 49 49.1	1.8	19.2	1.38
7	10 47.0	13 49 39.48	9 43 42.1	2.0	21.1	1.52	22	7 34.7	13 38 13.42	8 50 1.6	1.8	19.1	1.37
8	10 42.6	13 49 13.11	9 41 23.9	2.0	21.0	1.51	23	7 30.8	13 38 13.22	8 50 18.0	1.8	19.1	1.37
9	10 38.2	13 48 47.06	9 39 7.7	2.0	21.0	1.51	24	7 26.9	13 38 13.71	8 50 38.3	1.8	19.0	1.37
10	10 33.9	13 48 21.36	9 36 53.7	2.0	21.0	1.51	25	7 23.0	13 38 14.87	8 51 2.6	1.8	19.0	1.36
11	10 29.5	13 47 56.01	−9 34 41.8	2.0	21.0	1.51	26	7 19.1	13 38 16.71	−8 51 30.8	1.8	18.9	1.36
12	10 25.2	13 47 31.04	9 32 32.1	2.0	20.9	1.51	27	7 15.2	13 38 19.23	8 52 2.9	1.8	18.9	1.35
13	10 20.8	13 47 6.47	9 30 24.8	2.0	20.9	1.50	28	7 11.3	13 38 22.42	8 52 38.8	1.8	18.8	1.35
14	10 16.5	13 46 42.29	9 28 20.0	2.0	20.9	1.50	29	7 7.4	13 38 26.28	8 53 18.5	1.8	18.7	1.35
15	10 12.2	13 46 18.54	9 26 17.6	2.0	20.8	1.50	30	7 3.6	13 38 30.81	8 54 2.1	1.8	18.7	1.34
16	10 7.9	13 45 55.22	−9 24 17.9	2.0	20.8	1.50	July 1	6 59.7	13 38 36.00	−8 54 49.4	1.8	18.6	1.34
17	10 3.6	13 45 32.36	9 22 20.9	2.0	20.8	1.49	2	6 55.9	13 38 41.85	8 55 40.5	1.7	18.5	1.34
18	9 59.3	13 45 9.96	9 20 26.7	2.0	20.7	1.49	3	6 52.1	13 38 48.36	8 56 35.4	1.7	18.5	1.33
19	9 55.0	13 44 48.04	9 18 35.3	1.9	20.7	1.49	4	6 48.3	13 38 55.53	8 57 34.0	1.7	18.4	1.33
20	9 50.7	13 44 26.62	9 16 46.9	1.9	20.7	1.49	5	6 44.5	13 39 3.35	8 58 36.2	1.7	18.4	1.32
21	9 46.4	13 44 5.70	−9 15 1.5	1.9	20.6	1.48	6	6 40.7	13 39 11.81	−8 59 42.1	1.7	18.3	1.32
22	9 42.1	13 43 45.30	9 13 19.2	1.9	20.6	1.48	7	6 36.9	13 39 20.91	9 0 51.7	1.7	18.3	1.32
23	9 37.8	13 43 25.43	9 11 40.0	1.9	20.6	1.48	8	6 33.1	13 39 30.66	9 2 5.0	1.7	18.2	1.31
24	9 33.6	13 43 6.10	9 10 4.0	1.9	20.5	1.48	9	6 29.3	13 39 41.04	9 3 21.8	1.7	18.2	1.31
25	9 29.4	13 42 47.32	9 8 31.3	1.9	20.5	1.47	10	6 25.6	13 39 52.06	9 4 42.1	1.7	18.1	1.31
26	9 25.1	13 42 29.11	−9 7 2.0	1.9	20.4	1.47	11	6 21.9	13 40 3.71	−9 6 6.0	1.7	18.1	1.30
27	9 20.9	13 42 11.48	9 5 36.0	1.9	20.4	1.47	12	6 18.1	13 40 15.99	9 7 33.4	1.7	18.0	1.30
28	9 16.7	13 41 54.42	9 4 13.5	1.9	20.4	1.46	13	6 14.4	13 40 28.89	9 9 4.2	1.7	18.0	1.29
29	9 12.5	13 41 37.95	9 2 54.4	1.9	20.3	1.46	14	6 10.7	13 40 42.43	9 10 38.5	1.7	17.9	1.29
30	9 8.3	13 41 22.08	9 1 39.0	1.9	20.3	1.46	15	6 7.0	13 40 56.58	9 12 16.2	1.7	17.9	1.29
31	9 4.1	13 41 6.81	−9 0 27.1	1.9	20.2	1.45	16	6 3.3	13 41 11.35	−9 13 57.3	1.7	17.8	1.28
June 1	8 59.9	13 40 52.15	8 59 18.8	1.9	20.2	1.45	17	5 59.6	13 41 26.73	9 15 41.7	1.7	17.8	1.28
2	8 55.8	13 40 38.11	8 58 14.2	1.9	20.2	1.45	18	5 56.0	13 41 42.72	9 17 29.5	1.7	17.7	1.27
3	8 51.6	13 40 24.69	8 57 13.2	1.9	20.1	1.44	19	5 52.3	13 41 59.31	9 19 20.6	1.7	17.7	1.27
4	8 47.5	13 40 11.90	8 56 16.0	1.9	20.1	1.44	20	5 48.7	13 42 16.51	9 21 15.0	1.7	17.6	1.27
5	8 43.3	13 39 59.75	−8 55 22.5	1.9	20.0	1.44	21	5 45.0	13 42 34.30	−9 23 12.5	1.6	17.6	1.26
6	8 39.2	13 39 48.22	8 54 32.7	1.9	20.0	1.43	22	5 41.4	13 42 52.68	9 25 13.2	1.6	17.5	1.26
7	8 35.1	13 39 37.34	8 53 46.6	1.9	19.9	1.43	23	5 37.8	13 43 11.65	9 27 17.0	1.6	17.5	1.26
8	8 31.0	13 39 27.10	8 53 4.4	1.9	19.9	1.43	24	5 34.2	13 43 31.20	9 29 24.0	1.6	17.4	1.25
9	8 26.9	13 39 17.50	8 52 26.1	1.9	19.8	1.42	25	5 30.6	13 43 51.32	9 31 34.1	1.6	17.4	1.25
10	8 22.8	13 39 8.56	−8 51 51.6	1.9	19.7	1.42	26	5 27.0	13 44 12.02	−9 33 47.2	1.6	17.3	1.25
11	8 18.8	13 39 0.28	8 51 20.9	1.8	19.7	1.41	27	5 23.4	13 44 33.27	9 36 3.2	1.6	17.3	1.24
12	8 14.7	13 38 52.67	8 50 54.1	1.8	19.6	1.41	28	5 19.8	13 44 55.08	9 38 22.1	1.6	17.2	1.24
13	8 10.7	13 38 45.71	8 50 31.2	1.8	19.6	1.41	29	5 16.3	13 45 17.44	9 40 44.0	1.6	17.2	1.24
14	8 6.6	13 38 39.43	8 50 12.2	1.8	19.5	1.40	30	5 12.7	13 45 40.34	9 43 8.7	1.6	17.1	1.23
15	8 2.6	13 38 33.81	−8 49 57.1	1.8	19.5	1.40	31	5 9.2	13 46 3.79	−3 45 36.3	1.6	17.1	1.23
16	7 58.6	13 38 28.87	−8 49 45.9	1.8	19.4	1.40	32	5 5.7	13 46 27.77	−9 48 6.6	1.6	17.0	1.23

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	12 43.1	7 25 20.83	+21 48 28.0	1.1	9.7	0.74	Feb. 14	9 32.0	7 11 9.30	+22 20 4.2	1.1	9.5	0.73
1	12 38.8	7 25 0.21	21 49 16.3	1.1	9.7	0.74	15	9 27.9	7 10 55.90	22 20 33.9	1.1	9.5	0.73
2	12 34.5	7 24 39.51	21 50 4.6	1.1	9.7	0.74	16	9 23.[illegible]	7 10 42.87	22 21 2.8	1.1	9.4	0.73
3	12 30.2	7 24 18.72	21 50 52.9	1.1	9.7	0.74	17	9 19.5	7 10 30.24	22 21 31.0	1.1	9.4	0.73
4	12 26.0	7 23 57.87	21 51 41.2	1.1	9.7	0.74	18	9 15.4	7 10 17.99	22 21 58.5	1.1	9.4	0.72
5	12 21.7	7 23 36.96	+21 52 29.6	1.1	9.7	0.74	19	9 11.3	7 10 6.15	+22 22 25.2	1.1	9.4	0.72
6	12 17.4	7 23 16.02	21 53 17.8	1.1	9.7	0.74	20	9 7.1	7 9 54.72	22 22 51.2	1.1	9.4	0.72
7	12 13.1	7 22 55.03	21 54 5.9	1.1	9.7	0.74	21	9 3.0	7 9 43.70	22 23 16.4	1.1	9.4	0.72
8	12 8.8	7 22 34.03	21 54 54.0	1.1	9.7	0.74	22	8 58.9	7 9 33.11	22 23 40.8	1.1	9.4	0.72
9	12 4.6	7 22 13.03	21 55 41.9	1.1	9.7	0.74	23	8 54.8	7 9 22.94	22 24 4.5	1.1	9.3	0.72
10	12 0.3	7 21 52.02	+21 56 29.7	1.1	9.7	0.74	24	8 50.7	7 9 13.20	+22 24 27.4	1.1	9.3	0.72
11	11 56.0	7 21 31.03	21 57 17.3	1.1	9.7	0.74	25	8 46.7	7 9 3.90	22 24 49.5	1.1	9.3	0.72
12	11 51.7	7 21 10.06	21 58 4.7	1.1	9.7	0.74	26	8 42.6	7 8 55.03	22 25 10.9	1.1	9.3	0.72
13	11 47.4	7 20 49.13	21 58 52.0	1.1	9.7	0.74	27	8 38.5	7 8 46.61	22 25 31.5	1.1	9.3	0.72
14	11 43.1	7 20 28.26	21 59 38.9	1.1	9.7	0.74	28	8 34.4	7 8 38.65	22 25 51.4	1.0	9.3	0.71
15	11 38.8	7 20 7.44	+22 0 25.5	1.1	9.7	0.74	Mar. 1	8 30.4	7 8 31.13	+22 26 10.4	1.0	9.3	0.71
16	11 34.6	7 19 46.70	22 1 11.9	1.1	9.7	0.74	2	8 26.3	7 8 24.07	22 26 28.7	1.0	9.2	0.71
17	11 30.3	7 19 26.04	22 1 57.9	1.1	9.7	0.74	3	8 22.3	7 8 17.46	22 26 46.1	1.0	9.2	0.71
18	11 26.0	7 19 5 50	22 2 43.5	1.1	9.7	0.74	4	8 18.3	7 8 11.32	22 27 2.8	1.0	9.2	0.71
19	11 21.8	7 18 45.06	22 3 28.8	1.1	9.7	0.74	5	8 14.2	7 8 5.64	22 27 18.8	1.0	9.2	0.71
20	11 17.5	7 18 24.74	+22 4 13.7	1.1	9.7	0.74	6	8 10.2	7 8 0.42	+22 27 33.9	1.0	9.2	0.71
21	11 13.2	7 18 4.55	22 4 58.3	1.1	9.7	0.74	7	8 6.2	7 7 55.65	22 27 48 3	1.0	9.2	0.71
22	11 8.9	7 17 44.51	22 5 42.4	1.1	9.7	0.74	8	8 2.2	7 7 51.37	22 28 1.9	1.0	9.1	0.71
23	11 4.7	7 17 24.63	22 6 26.1	1.1	9.7	0.74	9	7 58.2	7 7 47.55	22 28 14.7	1.0	9.1	0.70
24	11 0.4	7 17 4 92	22 7 9.3	1.1	9.7	0.74	10	7 54.2	7 7 44.20	22 28 26.8	1.0	9.1	0.70
25	10 56.2	7 16 45.39	+22 7 52.0	1.1	9.6	0.74	11	7 50.2	7 7 41.32	+22 28 38.0	1.0	9.1	0.70
26	10 51.9	7 16 26.06	22 8 34.2	1.1	9.6	0.74	12	7 46.3	7 7 38.92	22 28 48.4	1.0	9.1	0.70
27	10 47.7	7 16 6.94	22 9 15.9	1.1	9.6	0.74	13	7 42.3	7 7 36.98	22 28 58.1	1.0	9.1	0.70
28	10 43.4	7 15 48.03	22 9 57.1	1.1	9.6	0.74	14	7 38.4	7 7 35.52	22 29 7.0	1.0	9.1	0.70
29	10 39.2	7 15 29.36	22 10 37.8	1.1	9.6	0.74	15	7 34.4	7 7 34.53	22 29 15.0	1.0	9.0	0.70
30	10 34.9	7 15 10.92	+22 11 17.9	1.1	9.6	0.74	16	7 30.5	7 7 34.02	+22 29 22.3	1.0	9.0	0.70
31	10 30.7	7 14 52.74	22 11 57.4	1.1	9.6	0.74	17	7 26.5	7 7 33.99	22 29 28.8	1.0	9.0	0.69
Feb. 1	10 26.5	7 14 34.81	22 12 36.3	1.1	9.6	0.74	18	7 22.6	7 7 34.43	22 29 34.5	1.0	9.0	0.69
2	10 22.2	7 14 17.14	22 13 14.6	1.1	9.6	0.74	19	7 18.7	7 7 35.35	22 29 39.3	1.0	9.0	0.69
3	10 18.0	7 13 59.76	22 13 52.3	1.1	9.6	0.74	20	7 14.8	7 7 36.75	22 29 43.4	1.0	9.0	0.69
4	10 13.8	7 13 42.67	+22 14 29.4	1.1	9.6	0.74	21	7 10.9	7 7 38.63	+22 29 46.7	1.0	8.9	0.69
5	10 9.6	7 13 25.87	22 15 5.9	1.1	9.6	0.74	22	7 7.0	7 7 40.98	22 29 49.2	1.0	8.9	0 69
6	10 5.4	7 13 9.37	22 15 41.7	1.1	9.5	0.74	23	7 3.1	7 7 43.81	22 29 50.9	1.0	8.9	0.69
7	10 1.2	7 12 53.19	22 16 16.9	1.1	9.5	0.73	24	6 59.2	7 7 47.12	22 29 51.8	1.0	8.9	0.69
8	9 57.0	7 12 37.32	22 16 51.4	1.1	9.5	0.73	25	6 55.4	7 7 50.90	22 29 51.9	1.0	8.9	0.68
9	9 52.8	7 12 21.78	+22 17 25.3	1.1	9.5	0.73	26	6 51.5	7 7 55.15	+22 29 51.2	1.0	8.8	0.68
10	9 48.6	7 12 6.58	22 17 58.5	1.1	9.5	0.73	27	6 47.6	7 7 59.89	22 29 49.8	1.0	8.8	0.68
11	9 44.4	7 11 51.73	22 18 31.0	1.1	9.5	0.73	28	6 43.8	7 8 5.09	22 29 47.6	1.0	8.8	0.68
12	9 40.3	7 11 37.23	22 19 2.7	1.1	9.5	0.73	29	6 40.0	7 8 10.76	22 29 44.6	1.0	8.8	0.68
13	9 36.1	7 11 23.08	22 19 33.8	1.1	9.5	0.73	30	6 36.1	7 8 16.89	22 29 40.8	1.0	8.8	0.68
14	9 32.0	7 11 9.30	+22 20 4.2	1.1	9.5	0.73	31	6 32.3	7 8 23.49	+22 29 36.1	1.0	8.8	0.68
15	9 27.9	7 10 55.90	+22 20 33.9	1.1	9.5	0.73	32	6 28.5	7 8 30.55	+22 29 30.7	1.0	8.8	0.68

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	6 28.5	7 8 30.55	+22 29 30.7	1.0	8.8	0.68	Nov. 16	16 51.5	8 36 5.48	+18 59 37.6	1.0	8.9	0.68
2	6 24.7	7 8 38.08	22 29 24.5	1.0	8.7	0.68	17	16 47.6	8 36 5.66	18 59 45.4	1.0	9.0	0.68
3	6 20.9	7 8 46.05	22 29 17.5	1.0	8.7	0.67	18	16 43.6	8 36 5.38	18 59 55.0	1.0	9.0	0.68
4	6 17.1	7 8 54.47	22 29 9.6	1.0	8.7	0.67	19	16 39.7	8 36 4.64	19 0 6.3	1.0	9.0	0.68
5	6 13.3	7 9 3.34	22 29 1.1	1.0	8.7	0.67	20	16 35.8	8 36 3.43	19 0 19.3	1.0	9.0	0.68
6	6 9.5	7 9 12.66	+22 28 51.7	1.0	8.7	0.67	21	16 31.8	8 36 1.76	+19 0 33.9	1.0	9.0	0.68
7	6 5.8	7 9 22.42	22 28 41.5	1.0	8.7	0.67	22	16 27.8	8 35 59.64	19 0 50.3	1.0	9.0	0.68
8	6 2.0	7 9 32.62	22 28 30.5	1.0	8.7	0.67	23	16 23.9	8 35 57.07	19 1 8.4	1.0	9.0	0.68
9	5 58.2	7 9 43.27	22 28 18.8	1.0	8.7	0.67	24	16 19.9	8 35 54.04	19 1 28.0	1.0	9.1	0.68
10	5 54.5	7 9 54.34	22 28 6.2	1.0	8.7	0.66	25	16 15.9	8 35 50.55	19 1 49.4	1.0	9.1	0.69
11	5 50.8	7 10 5.84	+22 27 52.8	1.0	8.6	0 66	26	16 11.9	8 35 46.62	+19 2 12.5	1.0	9.1	0.69
12	5 47.0	7 10 17.77	22 27 38.7	1.0	8.6	0.66	27	16 7.9	8 35 42.23	19 2 37.2	1.0	9.1	0.69
13	5 43.3	7 10 30.12	22 27 23.7	1.0	8.6	0.66	28	16 3.9	8 35 37.41	19 3 3.5	1.0	9.1	0.69
14	5 39.6	7 10 42.90	22 27 8.0	1.0	8.6	0.66	29	15 59.9	8 35 32.13	19 3 31.4	1.0	9.2	0.69
15	5 35.9	7 10 56.09	22 26 51.5	1.0	8.5	0.66	30	15 55.9	8 35 26.42	19 4 1.1	1.0	9.2	0.69
Oct. 17	18 45.9	8 32 31.03	+19 8 31.5	1.0	8.4	0.64	Dec. 1	15 51.8	8 35 20.26	+19 4 32.2	1.0	9.2	0.69
18	18 42.2	8 32 44.40	19 7 51.2	1.0	8.4	0.64	2	15 47.8	8 35 13.66	19 5 5.0	1.0	9.2	0.69
19	18 38.5	8 32 57.36	19 7 12.3	1.0	8.5	0.64	3	15 43.7	8 35 6.63	19 5 39.3	1.0	9.2	0.70
20	18 34.7	8 33 9.91	19 6 34.9	1.0	8.5	0.64	4	15 39.6	8 34 59.17	19 6 15.2	1.0	9.2	0.70
21	18 31.0	8 33 22.06	19 5 58.9	1.0	8.5	0.64	5	15 35.6	8 34 51.28	19 6 52.6	1.0	9.2	0.70
22	18 27.3	8 33 33.78	+19 5 24.4	1.0	8.5	0.64	6	15 31.5	8 34 42.96	+19 7 31.6	1.1	9.3	0.70
23	18 23.5	8 33 45.09	19 4 51.3	1.0	8.6	0.65	7	15 27.4	8 34 34.21	19 8 12.1	1.1	9.3	0.70
24	18 19.8	8 33 55.98	19 4 19.8	1.0	8.6	0.65	8	15 23.3	8 34 25.03	19 8 54.0	1.1	9.3	0.70
25	18 16.0	8 34 6.45	19 3 49.8	1.0	8.6	0.65	9	15 19.3	8 34 15.45	19 9 37.4	1.1	9.3	0.70
26	18 12.3	8 34 16.49	19 3 21.3	1.0	8.6	0.65	10	15 15.2	8 34 5.45	19 10 22.2	1.1	9.3	0.70
27	18 8.5	8 34 26.11	+19 2 54.4	1.0	8.6	0.65	11	15 11.1	8 33 55.05	+19 11 8.5	1.1	9.3	0.70
28	18 4.7	8 34 35.30	19 2 29.0	1.0	8.6	0.65	12	15 6.9	8 33 44.24	19 11 56.2	1.1	9.3	0.70
29	18 0.9	8 34 44.06	19 2 5.2	1.0	8.7	0.65	13	15 2.8	8 33 33.04	19 12 45.2	1.1	9.4	0.71
30	17 57.1	8 34 52.38	19 1 43.0	1.0	8.7	0.65	14	14 58.7	8 33 21.44	19 13 35.6	1.1	9.4	0.71
31	17 53.3	8 35 0.27	19 1 22.3	1.0	8.7	0.66	15	14 54.6	8 33 9.46	19 14 27.3	1.1	9.4	0.71
Nov. 1	17 49.5	8 35 7.72	+19 1 3.3	1.0	8.7	0.66	16	14 50.4	8 32 57.10	+19 15 20.3	1.1	9.4	0.71
2	17 45.7	8 35 14.74	19 0 45.9	1.0	8.7	0.66	17	14 46.3	8 32 44.37	19 16 14.5	1.1	9.4	0.71
3	17 41.9	8 35 21.31	19 0 30.2	1.0	8.7	0.66	18	14 42.1	8 32 31.27	19 17 10.0	1.1	9.4	0.71
4	17 38.1	8 35 27.43	19 0 16.0	1.0	8.7	0.66	19	14 38.0	8 32 17.82	19 18 6.6	1.1	9.4	0.71
5	17 34.3	8 35 33.12	19 0 3.5	1.0	8.8	0.66	20	14 33.8	8 32 4.02	19 19 4.4	1.1	9.4	0.71
6	17 30.4	8 35 38.34	+18 59 52.7	1.0	8.8	0.66	21	14 29.6	8 31 49.87	+19 20 3.4	1.1	9.4	0.71
7	17 26.5	8 35 43.11	18 59 43.6	1.0	8.8	0.66	22	14 25.5	8 31 35.39	19 21 3.4	1.1	9.5	0.71
8	17 22.7	8 35 47.43	18 59 36.1	1.0	8.8	0.67	23	14 21.3	8 31 20.58	19 22 4.5	1.1	9.5	0.72
9	17 18.8	8 35 51.30	18 59 30.4	1.0	8.8	0.67	24	14 17.1	8 31 5.46	19 23 6.5	1.1	9 5	0.72
10	17 14.9	8 35 54.70	18 59 26.3	1.0	8.8	0.67	25	14 12.9	8 30 50.02	19 24 9.6	1.1	9.5	0.72
11	17 11.1	8 35 57.65	+18 59 23.9	1.0	8.8	0.67	26	14 8.7	8 30 34.28	+19 25 13.6	1.1	9.5	0.72
12	17 7.2	8 36 0.14	18 59 23.2	1.0	8.9	0.67	27	14 4.5	8 30 18.24	19 26 18.5	1.1	9.5	0.72
13	17 3.3	8 36 2.17	18 59 24.2	1.0	8.9	0.67	28	14 0.3	8 30 1.92	19 27 24.3	1.1	9.5	0.72
14	16 59.3	8 36 3 74	18 59 27.0	1.0	8.9	0.67	29	13 56.1	8 29 45.32	19 28 31.0	1.1	9.5	0.72
15	16 55.4	8 36 4.84	18 59 31.4	1.0	8.9	0.67	30	13 51.9	8 29 28.46	19 29 38.5	1.1	9.5	0.72
16	16 51.5	8 36 5.48	+18 59 37.6	1.0	8.9	0.68	31	13 47.7	8 29 11.33	+19 30 46.7	1.1	9.5	0.72
17	16 47.6	8 36 5.66	+18 59 45.4	1.0	9.0	0.68	32	13 43.5	8 28 53.95	+19 31 55.6	1.1	9.6	0.72

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	18 3.5	12 46 37.18	−4 15 10.7	0.5	1.8	0.12	Feb. 15	15 1.5	12 45 31.91	−4 6 40.8	0.5	1.9	0.13
1	17 59.6	12 46 40.33	4 15 28.4	0.5	1.8	0.12	16	14 57.5	12 45 26.06	4 6 2.2	0.5	1.9	0.13
2	17 55.7	12 46 43.27	4 15 44.7	0.5	1.8	0.12	17	14 53.5	12 45 20.06	4 5 22.5	0.5	1.9	0.13
3	17 51.8	12 46 46.01	4 15 59.8	0.5	1.8	0.12	18	14 49.4	12 45 13.89	4 4 41.9	0.5	1.9	0.13
4	17 47.9	12 46 48.54	4 16 13.6	0.5	1.8	0.12	19	14 45.4	12 45 7.58	4 4 0.3	0.5	1.9	0.13
5	17 44.0	12 46 50.87	−4 16 26.0	0.5	1.8	0.12	20	14 41.4	12 45 1.11	−4 3 17.8	0.5	1.9	0.13
6	17 40.1	12 46 53.00	4 16 37.2	0.5	1.8	0.12	21	14 37.3	12 44 54.49	4 2 34.4	0.5	1.9	0.13
7	17 36.2	12 46 54.91	4 16 47.0	0.5	1.8	0.12	22	14 33.3	12 44 47.73	4 1 50.1	0.5	1.9	0.13
8	17 32.3	12 46 56.61	4 16 55.5	0.5	1.8	0.12	23	14 29.2	12 44 40.82	4 1 4.9	0.5	1.9	0.13
9	17 28.4	12 46 58.11	4 17 2.8	0.5	1.8	0.12	24	14 25.2	12 44 33.78	4 0 18.9	0.5	1.9	0.13
10	17 24.5	12 46 59.40	−4 17 8.7	0.5	1.8	0.12	25	14 21.1	12 44 26.61	−3 59 32.0	0.5	1.9	0.13
11	17 20.6	12 47 0.49	4 17 13.2	0.5	1.8	0.12	26	14 17.1	12 44 19.29	3 58 44.3	0.5	1.9	0.13
12	17 16.7	12 47 1.36	4 17 16.5	0.5	1.8	0.12	27	14 13.0	12 44 11.85	3 57 55.9	0.5	1.9	0.13
13	17 12.8	12 47 2.03	4 17 18.5	0.5	1.8	0.12	28	14 9.0	12 44 4.29	3 57 6.7	0.5	1.9	0.13
14	17 8.8	12 47 2.49	4 17 19.1	0.5	1.9	0.12	Mar. 1	14 4.9	12 43 56.61	3 56 16.8	0.5	1.9	0.13
15	17 4.9	12 47 2.75	−4 17 18.5	0.5	1.9	0.12	2	14 0.8	12 43 48.81	−3 55 26.1	0.5	1.9	0.13
16	17 1.0	12 47 2.79	4 17 16.6	0.5	1.9	0.12	3	13 56.8	12 43 40.89	3 54 34.8	0.5	1.9	0.13
17	16 57.0	12 47 2.63	4 17 13.3	0.5	1.9	0.12	4	13 52.7	12 43 32.87	3 53 42.8	0.5	1.9	0.13
18	16 53.1	12 47 2.26	4 17 8.7	0.5	1.9	0.12	5	13 48.6	12 43 24.75	3 52 50.2	0.5	1.9	0.13
19	16 49.2	12 47 1.69	4 17 2.8	0.5	1.9	0.12	6	13 44.6	12 43 16.51	3 51 56.9	0.5	1.9	0.13
20	16 45.2	12 47 0.90	−4 16 55.7	0.5	1.9	0.12	7	13 40.5	12 43 8.18	−3 51 3.0	0.5	1.9	0.13
21	16 41.3	12 46 59.91	4 16 47.2	0.5	1.9	0.12	8	13 36.4	12 42 59.75	3 50 8.6	0.5	1.9	0.13
22	16 37.3	12 46 58.72	4 16 37.5	0.5	1.9	0.12	9	13 32.3	12 42 51.23	3 49 13.7	0.5	1.9	0.13
23	16 33.4	12 46 57.32	4 16 26.6	0.5	1.9	0.12	10	13 28.3	12 42 42.62	3 48 18.2	0.5	1.9	0.13
24	16 29.4	12 46 55.71	4 16 14.2	0.5	1.9	0.12	11	13 24.2	12 42 33.93	3 47 22.2	0.5	1.9	0.13
25	16 25.4	12 46 53.90	−4 16 0.6	0.5	1.9	0.12	12	13 20.1	12 42 25.16	−3 46 25.8	0.5	1.9	0.13
26	16 21.5	12 46 51.90	4 15 45.7	0.5	1.9	0.13	13	13 16.0	12 42 16.31	3 45 28.9	0.5	1.9	0.13
27	16 17.5	12 46 49.69	4 15 29.6	0.5	1.9	0.13	14	13 12.0	12 42 7.38	3 44 31.5	0.5	1.9	0.13
28	16 13.5	12 46 47.28	4 15 12.3	0.5	1.9	0.13	15	13 7.9	12 41 58.39	3 43 33.7	0.5	1.9	0.13
29	16 9.6	12 46 44.68	4 14 53.7	0.5	1.9	0.13	16	13 3.8	12 41 49.33	3 42 35.6	0.5	1.9	0.13
30	16 5.6	12 46 41.87	−4 14 33.9	0.5	1.9	0.13	17	12 59.7	12 41 40.21	−3 41 37.1	0.5	1.9	0.13
31	16 1.6	12 46 38.88	4 14 12.9	0.5	1.9	0.13	18	12 55.6	12 41 31.02	3 40 38.3	0.5	1.9	0.13
Feb. 1	15 57.6	12 46 35.69	4 13 50.7	0.5	1.9	0.13	19	12 51.5	12 41 21.79	3 39 39.1	0.5	1.9	0.13
2	15 53.6	12 46 32.31	4 13 27.4	0.5	1.9	0.13	20	12 47.5	12 41 12.51	3 38 39.7	0.5	1.9	0.13
3	15 49.6	12 46 28.74	4 13 2.8	0.5	1.9	0.13	21	12 43.4	12 41 3.18	3 37 40.1	0.5	1.9	0.13
4	15 45.7	12 46 24.99	−4 12 37.1	0.5	1.9	0.13	22	12 39.3	12 40 53.81	−3 36 40.2	0.5	1.9	0.13
5	15 41.7	12 46 21.05	4 12 10.2	0.5	1.9	0.13	23	12 35.2	12 40 44.40	3 35 40.1	0.5	1.9	0.13
6	15 37.7	12 46 16.93	4 11 42.2	0.5	1.9	0.13	24	12 31.1	12 40 34.96	3 34 39.9	0.5	1.9	0.13
7	15 33.7	12 46 12.63	4 11 13.0	0.5	1.9	0.13	25	12 27.0	12 40 25.50	3 33 39.6	0.5	1.9	0.13
8	15 29.7	12 46 8.15	4 10 42.7	0.5	1.9	0.13	26	12 22.9	12 40 16.01	3 32 39.1	0.5	1.9	0.13
9	15 25.7	12 46 3.49	−4 10 11.4	0.5	1.9	0.13	27	12 18.8	12 40 6.50	−3 31 38.5	0.5	1.9	0.13
10	15 21.7	12 45 58.65	4 9 38.9	0.5	1.9	0.13	28	12 14.7	12 39 56.98	3 30 37.9	0.5	1.9	0.13
11	15 17.6	12 45 53.64	4 9 5.4	0.5	1.9	0.13	29	12 10.6	12 39 47.44	3 29 37.3	0.5	1.9	0.13
12	15 13.6	12 45 48.46	4 8 30.8	0.5	1.9	0.13	30	12 6.6	12 39 37.90	3 28 36.7	0.5	1.9	0.13
13	15 9.6	12 45 43.11	4 7 55.2	0.5	1.9	0.13	31	12 2.5	12 39 28.36	3 27 36.1	0.5	1.9	0.13
14	15 5.5	12 45 37.59	−4 7 18.5	0.5	1.9	0.13	Apr. 1	11 58.4	12 39 18.82	−3 26 35.5	0.5	1.9	0.13
15	15 1.5	12 45 31.91	−4 6 40.8	0.5	1.9	0.13	2	11 54.3	12 39 9.29	−3 25 35.0	0.5	1.9	0.13

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	11 58.4	12 39 18.82	−3 26 35.5	0.5	1.9	0.13	May 16	8 55.4	12 33 14.47	−2 48 45.1	0.5	1.9	0.13
2	11 54.3	12 39 9.29	3 25 35.0	0.5	1.9	0.13	17	8 51.4	12 33 9.03	2 48 12.5	0.5	1.9	0.13
3	11 50.2	12 38 59.77	3 24 34.7	0.5	1.9	0.13	18	8 47.4	12 33 3.76	2 47 40.9	0.5	1.9	0.13
4	11 46.1	12 38 50.26	3 23 34.5	0.5	1.9	0.13	19	8 43.3	12 32 58.65	2 47 10.5	0.5	1.9	0.13
5	11 42.0	12 38 40.78	3 22 34.5	0.5	1.9	0.13	20	8 39.3	12 32 53.71	2 46 41.1	0.5	1.9	0.13
6	11 37.9	12 38 31.31	−3 21 34.6	0.5	1.9	0.13	21	8 35.3	12 32 48.93	−2 46 12.7	0.5	1.9	0.13
7	11 33.8	12 38 21.88	3 20 34.9	0.5	1.9	0.13	22	8 31.3	12 32 44.32	2 45 45.5	0.5	1.9	0.13
8	11 29.7	12 38 12.47	3 19 35.5	0.5	1.9	0.13	23	8 27.3	12 32 39.88	2 45 19.4	0.5	1.9	0.13
9	11 25.6	12 38 3.10	3 18 36.3	0.5	1.9	0.13	24	8 23.3	12 32 35.62	2 44 54.5	0.5	1.9	0.13
10	11 21.6	12 37 53.77	3 17 37.3	0.5	1.9	0.13	25	8 19.3	12 32 31.53	2 44 30.6	0.5	1.9	0.13
11	11 17.5	12 37 44.48	−3 16 38.8	0.5	1.9	0.13	26	8 15.3	12 32 27.61	−2 44 7.9	0.5	1.9	0.13
12	11 13.4	12 37 35.23	3 15 40.6	0.5	1.9	0.13	27	8 11.3	12 32 23.88	2 43 46.4	0.5	1.9	0.13
13	11 9.3	12 37 26.03	3 14 42.7	0.5	1.9	0.13	28	8 7.3	12 32 20.32	2 43 26.0	0.5	1.9	0.13
14	11 5.2	12 37 16.89	3 13 45.2	0.5	1.9	0.13	29	8 3.3	12 32 16.93	2 43 6.8	0.5	1.9	0.13
15	11 1.2	12 37 7.81	3 12 48.1	0.5	1.9	0.13	30	7 59.3	12 32 13.73	2 42 48.8	0.5	1.9	0.13
16	10 57.1	12 36 58.78	−3 11 51.4	0.5	1.9	0.13	31	7 55.4	12 32 10.72	−2 42 32.0	0.5	1.9	0.13
17	10 53.0	12 36 49.82	3 10 55.2	0.5	1.9	0.13	June 1	7 51.4	12 32 7.88	2 42 16.4	0.5	1.9	0.13
18	10 48.9	12 36 40.93	3 9 59.5	0.5	1.9	0.13	2	7 47.4	12 32 5.23	2 42 1.9	0.5	1.9	0.13
19	10 44.8	12 36 32.11	3 9 4.3	0.5	1.9	0.13	3	7 43.4	12 32 2.76	2 41 48.7	0.5	1.9	0.13
20	10 40.7	12 36 23.37	3 8 9.6	0.5	1.9	0.13	4	7 39.5	12 32 0.48	2 41 36.7	0.5	1.9	0.12
21	10 36.7	12 36 14.72	−3 7 15.5	0.5	1.9	0.13	5	7 35.5	12 31 58.38	−2 41 25.9	0.5	1.9	0.12
22	10 32.6	12 36 6.15	3 6 22.0	0.5	1.9	0.13	6	7 31.5	12 31 56.47	2 41 16.3	0.5	1.9	0.12
23	10 28.5	12 35 57.66	3 5 29.0	0.5	1.9	0.13	7	7 27.6	12 31 54.75	2 41 7.9	0.5	1.9	0.12
24	10 24.5	12 35 49.27	3 4 36.6	0.5	1.9	0.13	8	7 23.6	12 31 53.22	2 41 0.7	0.5	1.9	0.12
25	10 20.4	12 35 40.97	3 3 45.0	0.5	1.9	0.13	9	7 19.7	12 31 51.88	2 40 54.8	0.5	1.9	0.12
26	10 16.3	12 35 32.78	−3 2 54.0	0.5	1.9	0.13	10	7 15.7	12 31 50.72	−2 40 50.1	0.5	1.9	0.12
27	10 12.3	12 35 24.68	3 2 3.7	0.5	1.9	0.13	11	7 11.8	12 31 49.76	2 40 46.6	0.5	1.9	0.12
28	10 8.2	12 35 16.69	3 1 14.1	0.5	1.9	0.13	12	7 7.8	12 31 48.99	2 40 44.4	0.5	1.9	0.12
29	10 4.1	12 35 8.82	3 0 25.2	0.5	1.9	0.13	13	7 3.9	12 31 48.41	2 40 43.4	0.5	1.9	0.12
30	10 0.1	12 35 1.06	2 59 37.2	0.5	1.9	0.13	14	6 59.9	12 31 48.02	2 40 43.6	0.5	1.9	0.12
May 1	9 56.0	12 34 53.41	−2 58 49.9	0.5	1.9	0.13	15	6 56.0	12 31 47.83	−2 40 45.1	0.5	1.9	0.12
2	9 51.9	12 34 45.89	2 58 3.4	0.5	1.9	0.13	16	6 52.1	12 31 47.83	2 40 47.9	0.5	1.9	0.12
3	9 47.9	12 34 38.48	2 57 17.7	0.5	1.9	0.13	17	6 48.1	12 31 48.02	2 40 51.9	0.5	1.9	0.12
4	9 43.8	12 34 31.20	2 56 32.8	0.5	1.9	0.13	18	6 44.2	12 31 48.41	2 40 57.1	0.5	1.9	0.12
5	9 39.8	12 34 24.04	2 55 48.7	0.5	1.9	0.13	19	6 40.3	12 31 48.99	2 41 3.6	0.5	1.8	0.12
6	9 35.7	12 34 17.01	−2 55 5.6	0.5	1.9	0.13	20	6 36.4	12 31 49.77	−2 41 11.4	0.5	1.8	0.12
7	9 31.7	12 34 10.12	2 54 23.3	0.5	1.9	0.13	21	6 32.5	12 31 50.75	2 41 20.4	0.5	1.8	0.12
8	9 27.7	12 34 3.37	2 53 41.9	0.5	1.9	0.13	22	6 28.5	12 31 51.92	2 41 30.7	0.5	1.8	0.12
9	9 23.6	12 33 56.74	2 53 1.4	0.5	1.9	0.13	23	6 24.6	12 31 53.28	2 41 42.3	0.5	1.8	0.12
10	9 19.6	12 33 50.26	2 52 21.9	0.5	1.9	0.13	24	6 20.7	12 31 54.84	2 41 55.0	0.5	1.8	0.12
11	9 15.6	12 33 43.93	−2 51 43.3	0.5	1.9	0.13	25	6 16.8	12 31 56.59	−2 42 9.1	0.5	1.8	0.12
12	9 11.5	12 33 37.74	2 51 5.7	0.5	1.9	0.13	26	6 12.9	12 31 58.54	2 42 24.3	0.5	1.8	0.12
13	9 7.5	12 33 31.69	2 50 29.1	0.5	1.9	0.13	27	6 9.0	12 32 0.68	2 42 40.8	0.5	1.8	0.12
14	9 3.4	12 33 25.79	2 49 53.4	0.5	1.9	0.13	28	6 5.1	12 32 3.01	2 42 58.6	0.5	1.8	0.12
15	8 59.4	12 33 20.05	2 49 18.7	0.5	1.9	0.13	29	6 1.2	12 32 5.54	2 43 17.6	0.5	1.8	0.12
16	8 55.4	12 33 14.47	−2 48 45.1	0.5	1.9	0.13	30	5 57.4	12 32 8.26	−2 43 37.8	0.5	1.8	0.12
17	8 51.4	12 33 9.03	−2 48 12.5	0.5	1.9	0.13	31	5 53.5	12 32 11.17	−2 43 59.2	0.5	1.8	0.12

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	8 52.1	3 33 46.18	+17 24 29.6	0.3	1.3	0.09	Feb. 15	5 50.1	3 32 33.98	+17 23 2.6	0.3	1.3	0.09
1	8 48.1	3 33 41.78	17 24 17.1	0.3	1.3	0.09	16	5 46.2	3 32 35.63	17 23 12.1	0.3	1.3	0.09
2	8 44.1	3 33 37.50	17 24 5.1	0.3	1.3	0.09	17	5 42.3	3 32 37.41	17 23 22.3	0.3	1.3	0.09
3	8 40.1	3 33 33.31	17 23 53.6	0.3	1.3	0.09	18	5 38.4	3 32 39.33	17 23 33.0	0.3	1.3	0.09
4	8 36.1	3 33 29.23	17 23 42.4	0.3	1.3	0.09	19	5 34.5	3 32 41.38	17 23 44.0	0.3	1.3	0.09
5	8 32.1	3 33 25.26	+17 23 31.7	0.3	1.3	0.09	20	5 30.6	3 32 43.59	+17 23 55.6	0.3	1.3	0.09
6	8 28.1	3 33 21.41	17 23 21.2	0.3	1.3	0.09	21	5 26.7	3 32 45.92	17 24 7.6	0.3	1.3	0.09
7	8 24.1	3 33 17.68	17 23 11.4	0.3	1.3	0.09	22	5 22.8	3 32 48.39	17 24 20.1	0.3	1.3	0.09
8	8 20.1	3 33 14.06	17 23 2.0	0.3	1.3	0.09	23	5 18.9	3 32 51.00	17 24 33.1	0.3	1.3	0.09
9	8 16.2	3 33 10.57	17 22 53.0	0.3	1.3	0.09	24	5 15.0	3 32 53.76	17 24 46.5	0.3	1.3	0.09
10	8 12.2	3 33 7.20	+17 22 44.6	0.3	1.3	0.09	25	5 11.1	3 32 56.64	+17 25 0.4	0.3	1.3	0.09
11	8 8.2	3 33 3.94	17 22 36.6	0.3	1.3	0.09	26	5 7.3	3 32 59.65	17 25 14.7	0.3	1.3	0.09
12	8 4.2	3 33 0.81	17 22 29.0	0.3	1.3	0.09	27	5 3.4	3 33 2.80	17 25 29.5	0.3	1.3	0.09
13	8 0.2	3 32 57.81	17 22 21.9	0.3	1.3	0.09	28	4 59.5	3 33 6.08	17 25 44.7	0.3	1.3	0.09
14	7 56.2	3 32 54.92	17 22 15.2	0.3	1.3	0.09	29	4 55.6	3 33 9.49	17 26 0.3	0.3	1.3	0.09
15	7 52.2	3 32 52.16	+17 22 9.0	0.3	1.3	0.09	Sept. 1	17 8.2	3 53 8.83	+18 30 37.6	0.3	1.3	0.09
16	7 48.3	3 32 49.54	17 22 3.2	0.3	1.3	0.09	2	17 4.2	3 53 8.88	18 30 34.4	0.3	1.3	0.09
17	7 44.3	3 32 47.04	17 21 58.0	0.3	1.3	0.09	3	17 0.3	3 53 8.80	18 30 31.0	0.3	1.3	0.09
18	7 40.3	3 32 44.68	17 21 53.2	0.3	1.3	0.09	4	16 56.4	3 53 8.58	18 30 27.0	0.3	1.3	0.09
19	7 36.4	3 32 42.44	17 21 49.0	0.3	1.3	0.09	5	16 52.4	3 53 8.23	18 30 22.6	0.3	1.3	0.09
20	7 32.4	3 32 40.34	+17 21 45.2	0.3	1.3	0.09	6	16 48.5	3 53 7.74	+18 30 17.8	0.3	1.3	0.09
21	7 28.4	3 32 38.36	17 21 41.9	0.3	1.3	0.09	7	16 44.5	3 53 7.11	18 30 12.7	0.3	1.3	0.09
22	7 24.5	3 32 36.52	17 21 39.2	0.3	1.3	0.09	8	16 40.6	3 53 6.36	18 30 7.1	0.3	1.3	0.09
23	7 20.5	3 32 34.82	17 21 36.9	0.3	1.3	0.09	9	16 36.6	3 53 5.46	18 30 1.2	0.3	1.3	0.09
24	7 16.6	3 32 33.26	17 21 35.2	0.3	1.3	0.09	10	16 32.7	3 53 4.44	18 29 54.8	0.3	1.3	0.09
25	7 12.6	3 32 31.83	+17 21 33.9	0.3	1.3	0.09	11	16 28.7	3 53 3.27	+18 29 48.1	0.3	1.3	0.09
26	7 8.6	3 32 30.52	17 21 33.1	0.3	1.3	0.09	12	16 24.8	3 53 1.97	18 29 41.0	0.3	1.3	0.09
27	7 4.7	3 32 29.37	17 21 32.8	0.3	1.3	0.09	13	16 20 8	3 53 0.54	18 29 33.4	0.3	1.3	0.09
28	7 0.7	3 32 28.35	17 21 33.0	0.3	1.3	0.09	14	16 16.9	3 52 58.98	18 29 25.5	0.3	1.3	0.09
29	6 56.8	3 32 27.47	17 21 33.8	0.3	1.3	0.09	15	16 12.9	3 52 57.28	18 29 17.2	0.3	1.3	0.09
30	6 52.8	3 32 26.73	+17 21 35.0	0.3	1.3	0.09	16	16 9.0	3 52 55.46	+18 29 8.6	0.3	1.3	0.09
31	6 48.9	3 32 26.13	17 21 36.7	0.3	1.3	0.09	17	16 5.0	3 52 53.49	18 28 59.5	0.3	1.3	0.09
Feb. 1	6 45.0	3 32 25.68	17 21 39.0	0.3	1.3	0.09	18	16 1.0	3 52 51.41	18 28 50.0	0.3	1.3	0.69
2	6 41.0	3 32 25.35	17 21 41.7	0.3	1.3	0.09	19	15 57.0	3 52 49.17	18 28 40.1	0.3	1.3	0.09
3	6 37.1	3 32 25.17	17 21 44.9	0.3	1.3	0.09	20	15 53.1	3 52 46.82	18 28 30.0	0.3	1.3	0.09
4	6 33.2	3 32 25.15	+17 21 48.7	0.3	1.3	0.09	21	15 49.1	3 52 44.33	+18 28 19.4	0.3	1.3	0.09
5	6 29.2	3 32 25.25	17 21 52.9	0.3	1.3	0.09	22	15 45.1	3 52 41.74	18 28 8.5	0.3	1.3	0.09
6	6 25.3	3 32 25.49	17 21 57.7	0.3	1.3	0.09	23	15 41.1	3 52 39.00	18 27 57.3	0.3	1.3	0.09
7	6 21.4	3 32 25.88	17 22 3.0	0.3	1.3	0.09	24	15 37.2	3 52 36.16	18 27 45.7	0.3	1.3	0.09
8	6 17.5	3 32 26.40	17 22 8.7	0.3	1.3	0.09	25	15 33.2	3 52 33.17	18 27 33.7	0.3	1.3	00.9
9	6 13.5	3 32 27.05	+17 22 14.9	0.3	1.3	0.09	26	15 29.2	3 52 30.07	+18 27 21.3	0.3	1.3	0.09
10	6 9.6	3 32 27.86	17 22 21.7	0.3	1.3	0.09	27	15 25.2	3 52 26.85	18 27 8.6	0.3	1.3	0.09
11	6 5.7	3 32 28.80	17 22 28.9	0.3	1.3	0.09	28	15 21.2	3 52 23.50	18 26 55.6	0.3	1.3	0.09
12	6 1.8	3 32 29.89	17 22 36.6	0.3	1.3	0.09	29	15 17.2	3 52 20.04	18 26 42.3	0.3	1.3	0.09
13	5 57.9	3 32 31.12	17 22 44.8	0.3	1.3	0.09	30	15 13.3	3 52 16.47	18 26 28 6	0.3	1.3	0.09
14	5 54.0	3 32 32.47	+17 22 53.5	0.3	1.3	0.09	Oct. 1	15 9.3	3 52 12.77	+18 26 14.6	0.3	1.3	0.09
15	5 50.1	3 32 33.98	+17 23 2.6	0.3	1.3	0.09	2	15 5.3	3 52 8.97	+18 26 0.3	0.3	1.3	0.09

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	15 9.3	3 52 12.77	+18 26 14.6	0.3	1.3	0.09	Nov. 16	12 4.1	3 47 48.65	+18 11 23.7	0.3	1.3	0.09
2	15 5.3	3 52 8.97	18 26 0.3	0.3	1.3	0.09	17	12 0.0	3 47 41.70	18 11 1.6	0.3	1.3	0.09
3	15 1.3	3 52 5.06	18 25 45.7	0.3	1.3	0.09	18	11 55.9	3 47 34.76	18 10 39.7	0.3	1.3	0.09
4	14 57.3	3 52 1.02	18 25 30.8	0.3	1.3	0.09	19	11 51.8	3 47 27.81	18 10 17.6	0.3	1.3	0.09
5	14 53.3	3 51 56.87	18 25 15.5	0.3	1.3	0.09	20	11 47.8	3 47 20.84	18 9 55.7	0.3	1.3	0.09
6	14 49.3	3 51 52.61	+18 25 0.0	0.3	1.3	0.09	21	11 43.8	3 47 13.88	+18 9 33.8	0.3	1.3	0.09
7	14 45.3	3 51 48.26	18 24 44.1	0.3	1.3	0.09	22	11 39.7	3 47 6.90	18 9 12.0	0.3	1.3	0.09
8	14 41.3	3 51 43.80	18 24 28.0	0.3	1.3	0.09	23	11 35.7	3 46 59.96	18 8 50.2	0.3	1.3	0.09
9	14 37.3	3 51 39.23	18 24 11.6	0.3	1.3	0.09	24	11 31.6	3 46 53.01	18 8 28.6	0.3	1.3	0.09
10	14 33.2	3 51 34.56	18 23 55.0	0.3	1.3	0.09	25	11 27.6	3 46 46.08	18 8 7.0	0.3	1.3	0.09
11	14 29.2	3 51 29.80	+18 23 38.0	0.3	1.3	0.09	26	11 23.5	3 46 39.18	+18 7 45.6	0.3	1.3	0.09
12	14 25.2	3 51 24.91	18 23 20.8	0.3	1.3	0.09	27	11 19.5	3 46 32.28	18 7 24.2	0.3	1.3	0.09
13	14 21.2	3 51 19.94	18 23 3.3	0.3	1.3	0.09	28	11 15.4	3 46 25.39	18 7 3.0	0.3	1.3	0.09
14	14 17.2	3 51 14.86	18 22 45.5	0.3	1.3	0.09	29	11 11.4	3 46 18.52	18 6 41.7	0.3	1.3	0.09
15	14 13.2	3 51 9.70	18 22 27.5	0.3	1.3	0.09	30	11 7.4	3 46 11.68	18 6 20.7	0.3	1.3	0.09
16	14 9.2	3 51 4.44	+18 22 9.3	0.3	1.3	0.09	Dec. 1	11 3.3	3 46 4.87	+18 5 59.8	0.3	1.3	0.09
17	14 5.1	3 50 59.10	18 21 50.8	0.3	1.3	0.09	2	10 59.3	3 45 58.08	18 5 39.1	0.3	1.3	0.09
18	14 1.1	3 50 53.69	18 21 32.2	0.3	1.3	0.09	3	10 55.2	3 45 51.34	18 5 18.5	0.3	1.3	0.09
19	13 57.1	3 50 48.16	18 21 13.2	0.3	1.3	0.09	4	10 51.2	3 45 44.64	18 4 58.1	0.3	1.3	0.09
20	13 53.1	3 50 42.56	18 20 54.1	0.3	1.3	0.09	5	10 47.1	3 45 37.96	18 4 37.9	0.3	1.3	0.09
21	13 49.1	3 50 36.86	+18 20 34.7	0.3	1.3	0.09	6	10 43.1	3 45 31.31	+18 4 17.8	0.3	1.3	0.09
22	13 45.0	3 50 31.10	18 20 15.1	0.3	1.3	0.09	7	10 39.1	3 45 24.71	18 3 58.0	0.3	1.3	0.09
23	13 41.0	3 50 25.27	18 19 55.4	0.3	1.3	0.09	8	10 35.0	3 45 18.15	18 3 38.1	0.3	1.3	0.09
24	13 37.0	3 50 19.37	18 19 35.5	0.3	1.3	0.09	9	10 31.0	3 45 11.65	18 3 18.6	0.3	1.3	0.09
25	13 32.9	3 50 13.39	18 19 15.4	0.3	1.3	0.09	10	10 26.9	3 45 5.20	18 2 59.4	0.3	1.3	0.09
26	13 28.9	3 50 7.34	+18 18 55.1	0.3	1.3	0.09	11	10 22.9	3 44 58.81	+18 2 40.3	0.3	1.3	0.09
27	13 24.9	3 50 1.24	18 18 34.6	0.3	1.3	0.09	12	10 18.9	3 44 52.48	18 2 21.5	0.3	1.3	0.09
28	13 20.8	3 49 55.04	18 18 14.0	0.3	1.3	0.09	13	10 14.8	3 44 46.20	18 2 3.0	0.3	1.3	0.09
29	13 16.8	3 49 48.80	18 17 53.3	0.3	1.3	0.09	14	10 10.8	3 44 40.00	18 1 44.6	0.3	1.3	0.09
30	13 12.8	3 49 42.49	18 17 32.4	0.3	1.3	0.09	15	10 6.7	3 44 33.83	18 1 26.5	0.3	1.3	0.09
31	13 8.7	3 49 36.14	+18 17 11.4	0.3	1.3	0.09	16	10 2.7	3 44 27.74	+18 1 8.6	0.3	1.3	0.09
Nov. 1	13 4.7	3 49 29.74	18 16 50.3	0.3	1.3	0.09	17	9 58.7	3 44 21.72	18 0 51.1	0.3	1.3	0.09
2	13 0.6	3 49 23.27	18 16 29.1	0.3	1.3	0.09	18	9 54.7	3 44 15.78	18 0 33.8	0.3	1.3	0.09
3	12 56.6	3 49 16.77	18 16 7.7	0.3	1.3	0.09	19	9 50.6	3 44 9.92	18 0 17.0	0.3	1.3	0.09
4	12 52.6	3 49 10.20	18 15 46.2	0.3	1.3	0.09	20	9 46.6	3 44 4.12	18 0 0.2	0.3	1.3	0.09
5	12 48.5	3 49 3.59	+18 15 24.6	0.3	1.3	0.09	21	9 42.6	3 43 58.42	+17 59 44.0	0.3	1.3	0.09
6	12 44.5	3 48 56.92	18 15 3.0	0.3	1.3	0.09	22	9 38.5	3 43 52.80	17 50 27.8	0.3	1.3	0.09
7	12 40.4	3 48 50.22	18 14 41.2	0.3	1.3	0.09	23	9 34.5	3 43 47.24	17 59 12.1	0.3	1.3	0.09
8	12 36.4	3 48 43.50	18 14 19.5	0.3	1.3	0.09	24	9 30.5	3 43 41.78	17 58 56.7	0.3	1.3	0.09
9	12 32.3	3 48 36.74	18 13 57.6	0.3	1.3	0.09	25	9 26.5	3 43 36.41	17 58 41.6	0.3	1.3	0.09
10	12 28.3	3 48 29.95	+18 13 35.7	0.3	1.3	0.09	26	9 22.5	3 43 31.13	+17 58 27.0	0.3	1.3	0.09
11	12 24.2	3 48 23.13	18 13 13.8	0.3	1.3	0.09	27	9 18.4	3 43 25.95	17 58 12.5	0.3	1.3	0.09
12	12 20.2	3 48 16.28	18 12 51.8	0.3	1.3	0.09	28	9 14.4	3 43 20.86	17 57 58.5	0.3	1.3	0.09
13	12 16.2	3 48 9.38	18 12 29.8	0.3	1.3	0.09	29	9 10.4	3 43 15.87	17 57 44.8	0.3	1.3	0.09
14	12 12.1	3 48 2.48	18 12 7.7	0.3	1.3	0.09	30	9 6.4	3 43 10.97	17 57 31.5	0.3	1.3	0.09
15	12 8.1	3 47 55.57	+18 11 45.7	0.3	1.3	0.09	31	9 2.4	3 43 6.17	+17 57 18.5	0.3	1.3	0.09
16	12 4.1	3 47 48.65	+18 11 23.7	0.3	1.3	0.09	32	8 58.4	3 43 1.47	+17 57 6.0	0.3	1.3	0.09

PART III

PHENOMENA

ECLIPSES IN 1887.

In the year 1887 there will be four eclipses, two of the sun and two of the moon.

I.—*A Partial Eclipse of the Moon*, 1887, February 7—8, visible at Washington and also in the Pacific Ocean and part of Asia.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☍ in right ascension, February 7ᵈ 22ʰ 40ᵐ 24ˢ.9.

	h m s		s
Sun's right ascension	21 27 17.31	Hourly motion	9.95
Moon's right ascension	9 27 17.31	Hourly motion	151.28
	° ′ ″		′ ″
Sun's declination	15 0 37.2 S.	Hourly motion	0 47.5 N.
Moon's declination	14 11 41.4 N.	Hourly motion	8 28.2 S.
Sun's equa. hor. parallax	9.0	Sun's true semidiameter	16 12.7
Moon's equa. hor. parallax	60 55.3	Moon's true semidiameter	16 35.3

TIMES OF THE PHASES.

	Greenwich Mean Time.		Washington Mean Time.	
		d h m		d h m
Moon enters penumbra	February	7 20 1.2	February	7 14 53.0
Moon enters shadow		7 21 14.0		7 16 5.8
Middle of the eclipse		7 22 22.1		7 17 13.9
Moon leaves shadow		7 23 30.4		7 18 22.2
Moon leaves penumbra		8 0 43.1		7 19 34.9

CIRCUMSTANCES OF THE ECLIPSE.

Contacts of Shadow with moon's limb.	Angles of position from north point.	The moon being in the zenith in longitude from Greenwich and latitude.	
First	52° to E.	135° 45′ W.	14° 24′ N.
Last	27 to W.	168 31 W.	14 5 N.

Magnitude of the eclipse = 0.436, (moon's diameter = 1).

II.—*An Annular Eclipse of the Sun*, 1887, February 22, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, February 22ᵈ 9ʰ 13ᵐ 4ˢ.4

	h m s		s s
Sun and moon's R. A.	22 23 28.21	Hourly motions	9.52 and 116.43
	° ′ ″		′ ″
Sun's declination	10 3 27.6 S.	Hourly motion	0 54.8 N.
Moon's declination	10 37 18.3 S.	Hourly motion	8 13.2 N.
Sun's equa. hor. parallax	8.9	Sun's true semidiameter	16 9.7
Moon's equa. hor. parallax	54 6.1	Moon's true semidiameter	14 43.8

CIRCUMSTANCES OF THE ECLIPSE.

		Longitude from Greenwich.	Latitude.
	d h m	° ′	° ′
Eclipse begins on the earth generally, February	22 6 40.8	165 20.2 E.	37 37.3 S.
Central eclipse begins	22 7 58.7	140 41.6 E.	51 49.4 S.
Central eclipse at local apparent noon	22 9 13.1	134 51.2 W.	49 11.2 S.
Central eclipse ends	22 11 7.6	69 30.1 W.	21 25.9 S.
Eclipse ends on the earth generally	22 12 25.5	91 43.3 W.	6 58.4 S.

III.—*A Partial Eclipse of the Moon*, 1887, August 3, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☍ in right ascension, August 3ᵈ 9ʰ 4ᵐ 57ˢ.1

	h m s		s
Sun's right ascension	8 54 25.00	Hourly motion	9.65
Moon's right ascension	12 54 25.00	Hourly motion	129.06
Sun's declination	17° 26′ 21″.7 N.	Hourly motion	0′ 39″.4 S.
Moon's declination	16 42 39.7 S.	Hourly motion	5 50.2 N.
Sun's equa. hor. parallax	8.7	Sun's true semidiameter	15 46.2
Moon's equa. hor. parallax	55 37.5	Moon's true semidiameter	15 8.7

TIMES OF THE PHASES.

Greenwich Mean Time.			Washington Mean Time.	
		d h m		d h m
Moon enters penumbra	August	3 6 11.0	August	3 1 2.8
Moon enters shadow		3 7 35.5		3 2 27.3
Middle of the eclipse		3 8 48.9		3 3 40.7
Moon leaves shadow		3 10 2.2		3 4 54.0
Moon leaves penumbra		3 11 26.8		3 6 18.6

CIRCUMSTANCES OF THE ECLIPSE.

Contacts of Shadow with moon's limb.	Angles of position from north point.	The moon being in the zenith in longitude from Greenwich and latitude.	
First	130° to E.	66° 48′ E.	16° 51′ S.
Last	151 to W.	31 22 E.	16 37 S.

Magnitude of the eclipse = 0.424, (moon's diameter = 1).

IV.—*A Total Eclipse of the Sun*, 1887, August 18, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, August 18ᵈ 17ʰ 15ᵐ 28ˢ.5

	h m s		s s
Sun and moon's R. A.	9 52 31.01	Hourly motions	9.30 and 146.54
Sun's declination	12° 54′ 5″.6 N.	Hourly motion	0′ 48″.8 S.
Moon's declination	13 33 12.5 N.	Hourly motion	9 12.9 S.
Sun's equa. hor. parallax	8.8	Sun's true semidiameter	15 48.6
Moon's equa. hor. parallax	60 13.5	Moon's true semidiameter	16 23.8

CIRCUMSTANCES OF THE ECLIPSE.

	d h m	Longitude from Greenwich.	Latitude.
Eclipse begins on the earth generally, August	18 15 5.5	34° 23′.7 E.	37° 26′.7 N.
Central eclipse begins	18 16 11.2	11 15.8 E.	51 38.4 N.
Central eclipse at local apparent noon	18 17 15.5	102 1.1 E.	53 48.5 N.
Central eclipse ends	18 18 53.4	173 30.1 E.	24 27.1 N.
Eclipse ends on the earth generally	18 19 58.9	153 26.0 E.	9 53.0 N.

The regions within which the eclipses of the sun are visible, are laid down on the accompanying charts, from which, by means of the dotted lines, the Greenwich time of beginning or ending within fifteen or twenty minutes, may also be found.

BESSELIAN ELEMENTS OF THE ANNULAR ECLIPSE OF THE SUN, 1887, FEBRUARY 22.

Greenwich Mean Time.	Co-ordinates of Centre of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	x	y	Log sin d	Log cos d	μ	l	l'
h m					° ′		
6 40	−1.24223	−0.97202	−9.24370	+9.99322	96 34.7	+0.57237	+0.02636
50	1.16108	0.94953	9.24360	9.99323	99 4.8	0.57238	0.02637
7 0	−1.07992	−0.92704	−9.24349	+9.99323	101 34.8	+0.57239	+0.02639
10	0.99877	0.90455	9.24339	9.99323	104 4.8	0.57241	0.02641
20	0.91761	0.88205	9.24328	9.99324	106 34.8	0.57242	0.02642
30	0.83646	0.85955	9.24318	9.99324	109 4.9	0.57243	0.02643
40	0.75530	0.83704	9.24307	9.99324	111 34.9	0.57244	0.02644
50	0.67415	0.81453	9.24297	9.99325	114 4.9	0.57245	0.02645
8 0	−0.59299	−0.79201	−9.24286	+9.99325	116 34.9	+0.57246	+0.02646
10	0.51184	0.76949	9.24276	9.99325	119 5.0	0.57247	0.02647
20	0.43069	0.74696	9.24265	9.99326	121 35.0	0.57248	0.02648
30	0.34954	0.72443	9.24254	9.99326	124 5.0	0.57249	0.02649
40	0.26838	0.70189	9.24244	9.99326	126 35.0	0.57250	0.02650
50	0.18723	0.67935	9.24233	9.99327	129 5.1	0.57251	0.02651
9 0	−0.10608	−0.65681	−9.24222	+9.99327	131 35.1	+0.57252	+0.02652
10	−0.02493	0.63426	9.24212	9.99327	134 5.1	0.57252	0.02652
20	+0.05622	0.61171	9.24201	9.99328	136 35.2	0.57253	0.02653
30	0.13736	0.58915	9.24190	9.99328	139 5.2	0.57253	0.02653
40	0.21851	0.56659	9.24180	9.99328	141 35.2	0.57254	0.02654
50	0.29966	0.54402	9.24169	9.99329	144 5.2	0.57254	0.02654
10 0	+0.38080	−0.52145	−9.24158	+9.99329	146 35.3	+0.57255	+0.02655
10	0.46194	0.49887	9.24148	9.99329	149 5.3	0.57255	0.02655
20	0.54308	0.47629	9.24137	9.99330	151 35.3	0.57255	0.02655
30	0.62422	0.45371	9.24127	9.99330	154 5.3	0.57256	0.02656
40	0.70536	0.43112	9.24116	9.99330	156 35.4	0.57256	0.02656
50	0.78649	0.40853	9.24105	9.99331	159 5.4	0.57256	0.02656
11 0	+0.86762	−0.38593	−9.24094	+9.99331	161 35.4	+0.57257	+0.02657
10	0.94874	0.36333	9.24084	9.99331	164 5.4	0.57257	0.02657
20	1.02986	0.34073	9.24073	9.99332	166 35.5	0.57257	0.02657
30	1.11098	0.31812	9.24062	9.99332	169 5.5	0.57257	0.02657
40	1.19209	0.29551	9.24051	9.99332	171 35.5	0.57257	0.02657
50	1.27320	0.27289	9.24040	9.99333	174 5.5	0.57256	0.02656
12 0	+1.35430	−0.25026	−9.24029	+9.99333	176 35.6	+0.57256	+0.02656
10	1.43540	0.22763	9.24019	9.99333	179 5.6	0.57256	0.02656
20	1.51649	0.20500	9.24008	9.99334	181 35.6	0.57256	0.02656
30	+1.59757	−0.18237	−9.23997	+9.99334	184 5.6	+0.57255	+0.02655

Greenwich Mean Time.	Log Δ x for 1 Minute.	Log Δ y for 1 Minute.	Log Δ μ for 1 Minute.	Log Tangents of Angles of Cones—	
				Penumbra.	Shadow.
h m					
6 0	+7.9090	+7.3513	+1.1762	+7.67444	+7.67233
7 0	7.9093	7.3520	1.1762	7.67444	7.67232
8 0	7.9093	7.3528	1.1762	7.67443	7.67232
9 0	7.9093	7.3533	1.1762	7.67443	7.67232
10 0	7.9092	7.3537	1.1762	7.67442	7.67231
11 0	7.9092	7.3541	1.1762	7.67442	7.67231
12 0	+7.9091	+7.3546	+1.1762	+7.67442	+7.67230

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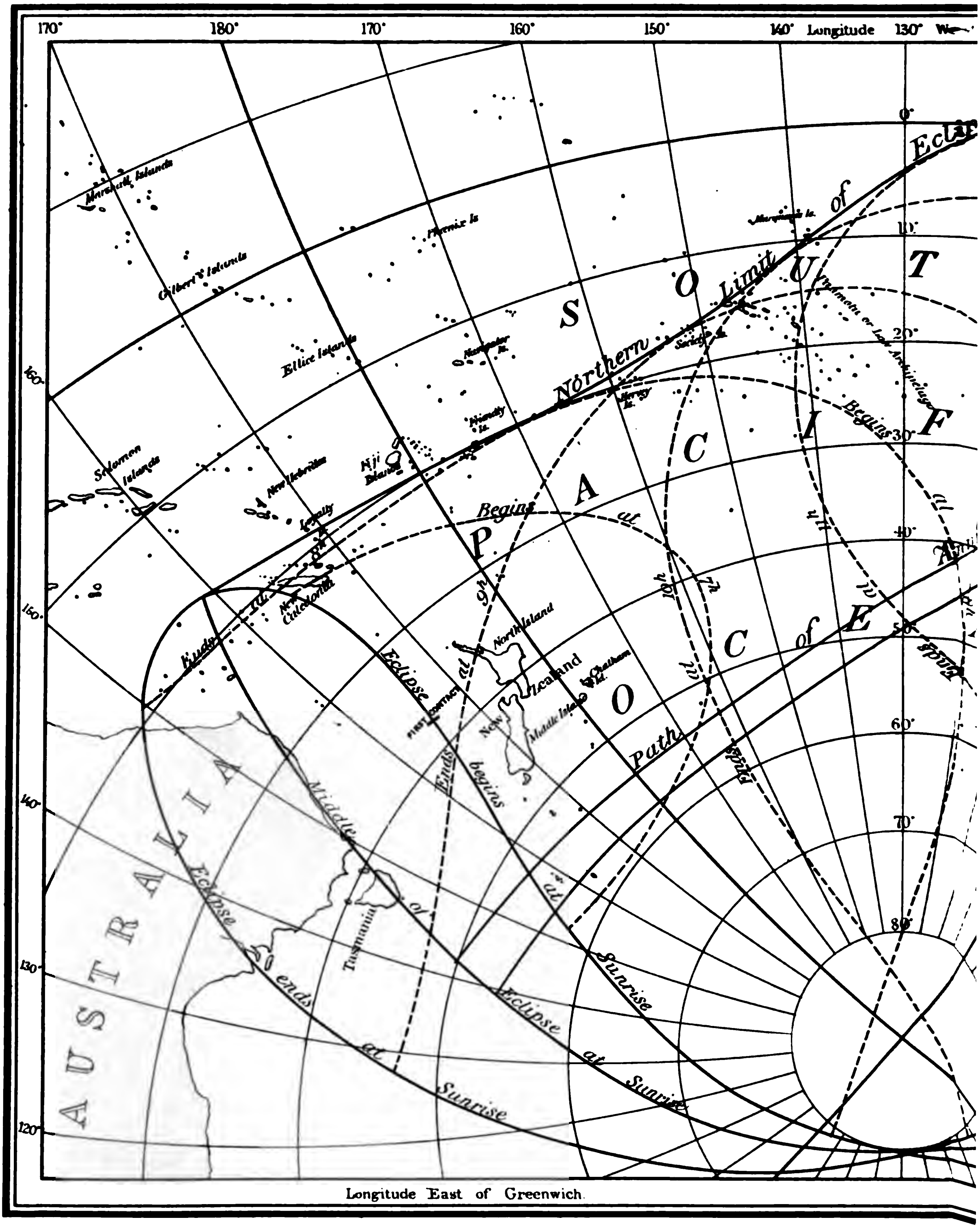
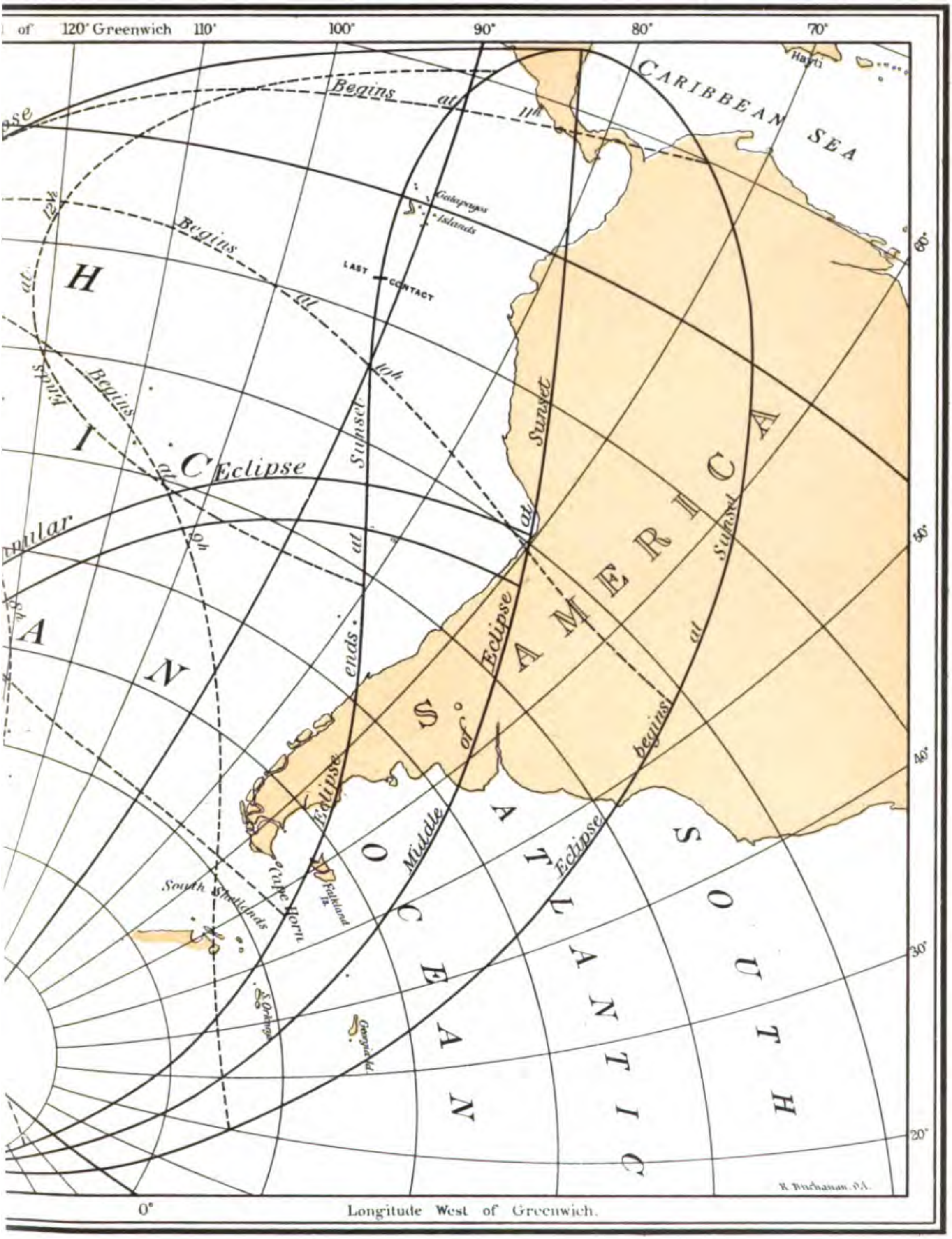
ANNULAR ECLIPSE



Note:- The hours of beginning and ending

OF FEBRUARY 22ND 1887.



re expressed in Greenwich Mean Time.

PATH OF ANNULUS DURING THE ANNULAR ECLIPSE OF THE SUN, 1887, FEBRUARY 22.

Greenwich Mean Time.	Northern Limit of Annulus Path.		Central Line.		Southern Limit of Annulus Path.		Duration of Annulus on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
	° ′	° ′	° ′	° ′	° ′	° ′	m s
Limits	−49 56.2	142 14.7 E.	−51 49.4	140 41.6 E.	−53 34.5	139 12.9 E.	
8h 0m	53 11.7	165 21.7	53 42.9	152 20.5			6 10.6
5	53 51.4	172 17.1	55 17.5	166 42.6	56 43.5	161 8.1	6 30.6
10	54 7.5	179 25.8 E.	55 47.6	175 38.0 E.	57 27.6	171 50.2	6 43.9
15	54 8.1	174 33.4 W.	55 54.0	177 20.0 W.	57 40.0	179 53.4 E.	6 55.0
20	53 58.4	169 21.0	55 46.7	171 24.5	57 35.0	173 28.1 W.	7 4.7
25	53 40.7	164 43.5	55 29.7	166 14.0	57 18.6	167 44.5	7 13.3
30	−53 17.3	160 34.1	−55 5.8	161 38.1	−56 54.3	162 42.1	7 20.9
35	52 48.8	156 47.4	54 36.3	157 29.5	56 23.8	158 11.7	7 27.8
40	52 16.4	153 19.4	54 2.5	153 43.0	55 48.5	154 6.6	7 34.0
45	51 40.8	150 7.3	53 25.1	150 15.4	55 9.5	150 23.6	7 39.6
50	51 2.4	147 8.8	52 44.9	147 3.7	54 27.3	146 58.6	7 44.5
55	50 21.6	144 22.3	52 2.1	144 5.7	53 42.5	143 49.1	7 48.8
9 0	−49 38.7	141 46.4	−51 17.1	141 19.8	−52 55.5	140 53.2	7 52.4
5	48 54.0	139 19.4	50 30.3	138 44.1	52 6.6	138 8.8	7 55.4
10	48 7.6	137 0.4	49 41.8	136 17.4	51 16.0	135 34.4	7 57.9
15	47 19.5	134 48.3	48 51.8	133 58.5	50 24.0	133 8.7	7 59.7
20	46 30.2	132 42.2	48 0.4	131 46.4	49 30.7	130 50.6	8 1.1
25	45 39.7	130 41.5	47 8.0	129 40.2	48 36.4	128 39.0	8 1.8
30	−44 48.1	128 45.3	−46 14.5	127 39.0	−47 41.0	126 32.8	8 2.1
35	43 55.3	126 52.8	45 19.9	125 42.0	46 44.6	124 31.3	8 1.8
40	43 1.3	125 3.4	44 24.3	123 48.4	45 47.2	122 33.5	8 1.0
45	42 6.3	123 16.5	43 27.6	121 57.6	44 48.9	120 38.7	7 59.6
50	41 10.1	121 31.4	42 29.8	120 8.7	43 49.5	118 45.9	7 57.7
55	40 13.0	119 47.6	41 31.1	118 21.2	42 49.3	116 54.8	7 55.4
10 0	−39 14.6	118 4.3	−40 31.3	116 34.3	−41 48.0	115 4.2	7 52.5
5	38 15.1	116 21.0	39 30.4	114 47.1	40 45.7	113 13.3	7 49.2
10	37 14.4	114 36.7	38 28.3	112 59.0	39 42.3	111 21.3	7 45.4
15	36 12.4	112 50.6	37 25.0	111 8.9	38 37.6	109 27.1	7 41.0
20	35 8.9	111 1.8	36 20.2	109 15.7	37 31.5	107 29.5	7 36.1
25	34 3.7	109 9.1	35 13.7	107 18.1	36 23.7	105 27.0	7 30.8
30	−32 56.7	107 11.3	−34 5.3	105 14.6	−35 14.0	103 17.9	7 24.8
35	31 47.5	105 6.8	32 54.7	103 3.1	34 1.9	100 59.4	7 18.4
40	30 35.8	102 52.6	31 41.4	100 40.7	32 46.9	98 28.7	7 11.3
45	29 20.8	100 26.0	30 24.5	98 3.1	31 28.1	95 40.2	7 3.6
50	28 1.7	97 42.3	29 2.8	95 4.3	30 3.9	92 26.2	6 54.9
55	26 37.0	94 33.5	27 34.4	91 31.9	28 31.8	88 30.3	6 45.2
11 0	−25 4.1	90 46.9	−25 54.4	87 1.3	−26 44.7	83 15.8	6 33.4
5	23 20.8	86 13.3	23 47.3	80 6.3			6 10.0
Limits	−19 32.5	70 32.1 W.	−21 25.9	69 30.1 W.	−23 19.7	68 27.2 W.	

BESSELIAN ELEMENTS OF THE TOTAL ECLIPSE OF THE SUN, 1887, AUGUST 18.

Greenwich Mean Time.	Co-ordinates of Centre of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	x	*y*	Log sin *d*	Log cos *d*	*μ*	*l*	*l′*
h m					° ′		
15 0	− 1.25353	+0.96658	+9.34978	+9.98885	224 6.3	+0.53617	−0.00967
10	1.16101	0.94333	9.34970	9.98885	226 36.3	0.53617	0.00967
20	1.06849	0.92008	9.34963	9.98886	229 6.4	0.53616	0.00968
30	0.97597	0.89682	9.94956	9.98886	231 36.4	0.53615	0.00968
40	0.88345	0.87355	9.34948	9.98886	234 6.4	0.53614	0.00969
50	0.79092	0.85027	9.34941	9.98887	236 36.5	0.53614	0.00969
16 0	−0.69839	+0.82698	+9.34934	+9.98887	239 6.5	+0.53613	−0.00970
10	0.60586	0.80368	9.34926	9.98887	241 36.5	0.53612	0.00970
20	0.51333	0.78038	9.34919	9.98888	244 6.6	0.53611	0.00971
30	0.42080	0.75707	9.34912	9.98888	246 36.6	0.53610	0.00972
40	0.32827	0.73376	9.34904	9.98888	349 6.7	0.53609	0.00973
50	0.23574	0.71044	9.34897	9.98889	251 36.7	0.53608	0.00974
17 0	−0.14320	+0.68712	+9.34890	+9.98889	254 6.7	+0.53607	−0.00975
10	−0.05067	0.66379	9.34883	9.98889	256 36.8	0.53606	0.00976
20	+0.04186	0.64045	9.34876	9.98890	259 6.8	0.53605	0.00978
30	0.13439	0.61710	9.34869	9.98890	261 36.8	0.53604	0.00979
40	0.22692	0.59375	9.34861	9.98891	264 6.9	0.53603	0.00981
50	0.31945	0.57039	9.34854	9.98891	266 36.9	0.53601	0.00982
18 0	+0.41197	+0.54702	+9.34847	+9.98892	269 7.0	+0.53599	−0.00984
10	0.50450	0.52364	9.34840	9.98892	271 37.0	0.53598	0.00985
20	0.59703	0.50025	9.34833	9.98892	274 7.0	0.53596	0.00987
30	0.68955	0.47686	9.34825	9.98893	276 37.1	0.53594	0.00989
40	0.78207	0.45347	9.34818	9.98893	279 7.1	0.53592	0.00991
50	0.87459	0.43007	9.34811	9.98894	281 37.1	0.53590	0.00993
19 0	+0.96710	+0.40667	+9.34803	+9.98894	284 7.2	+0.53588	−0.00994
10	1.05961	0.38326	9.34796	9.98894	286 37.2	0.53586	0.00996
20	1.15212	0.35985	9.34789	9.98895	289 7.2	0.53584	0.00998
30	1.24462	0.33643	9.34781	9.98895	291 37.3	0.53582	0.01000
40	1.33712	0.31300	9.34774	9.98895	294 7.3	0.53580	0.01002
50	1.42962	0.28957	9.34767	9.98896	296 37.4	0.53578	0.01004
20 0	+1.52211	+0.26613	+9.34759	+9.98896	299 7.4	+0.53575	−0.01007

Greenwich Mean Time.	Log Δ *x* for 1 Minute.	Log Δ *y* for 1 Minute.	Log Δ *μ* for 1 Minute.	Log Tangents of Angles of Cones—	
				Penumbra.	Shadow.
h m					
15 0	+7.9662	−7.3663	+1.1762	+7.66474	+7.66263
16 0	7.9663	7.3671	1.1762	7.66475	7.66263
17 0	7.9663	7.3679	1.1762	7.66475	7.66264
18 0	7.9663	7.3687	1.1762	7.66475	7.66264
19 0	7.9662	7.3694	1.1762	7.66476	7.66264
20 0	+7.9661	−7.3700	+1.1762	+7.66476	+7.66265

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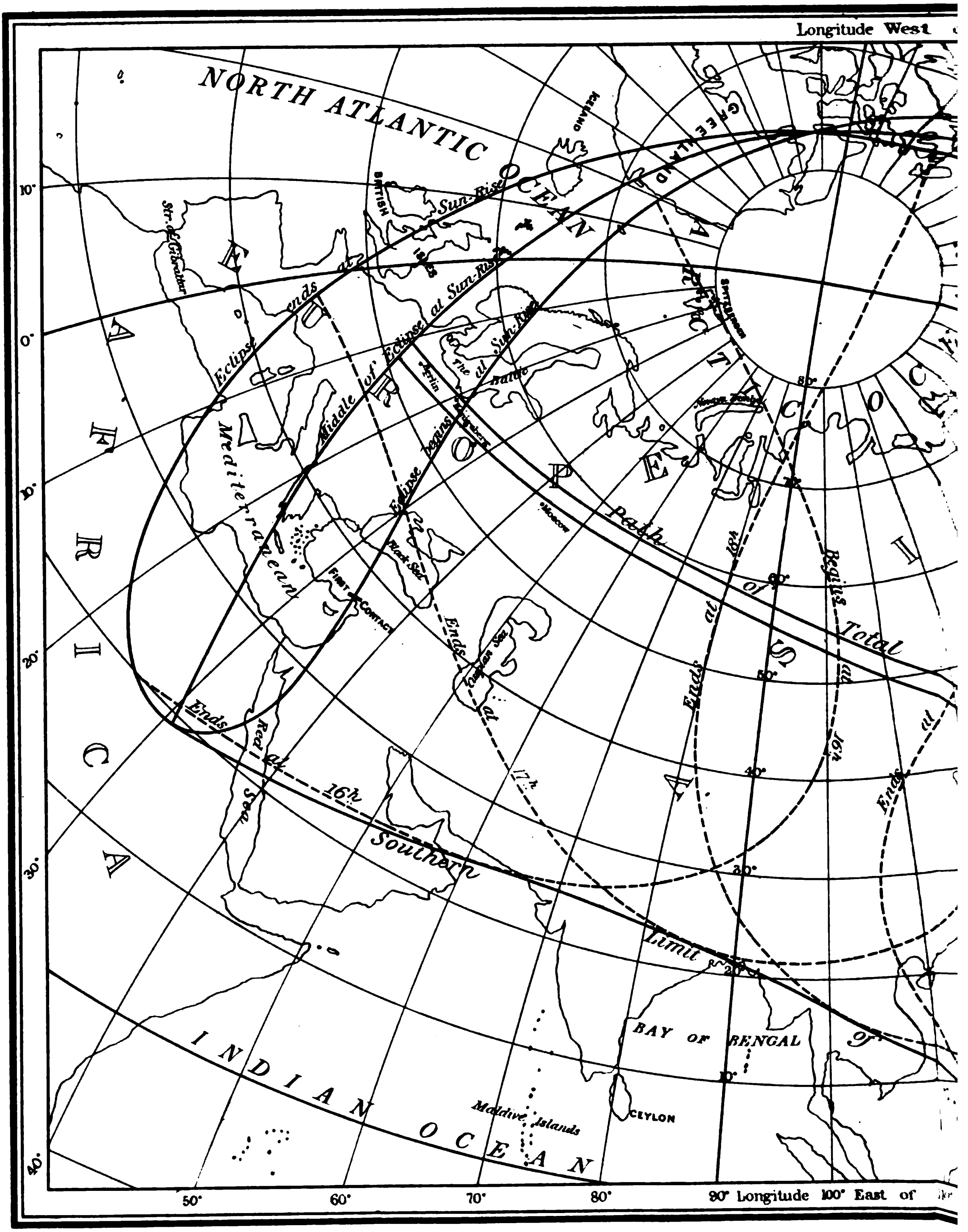
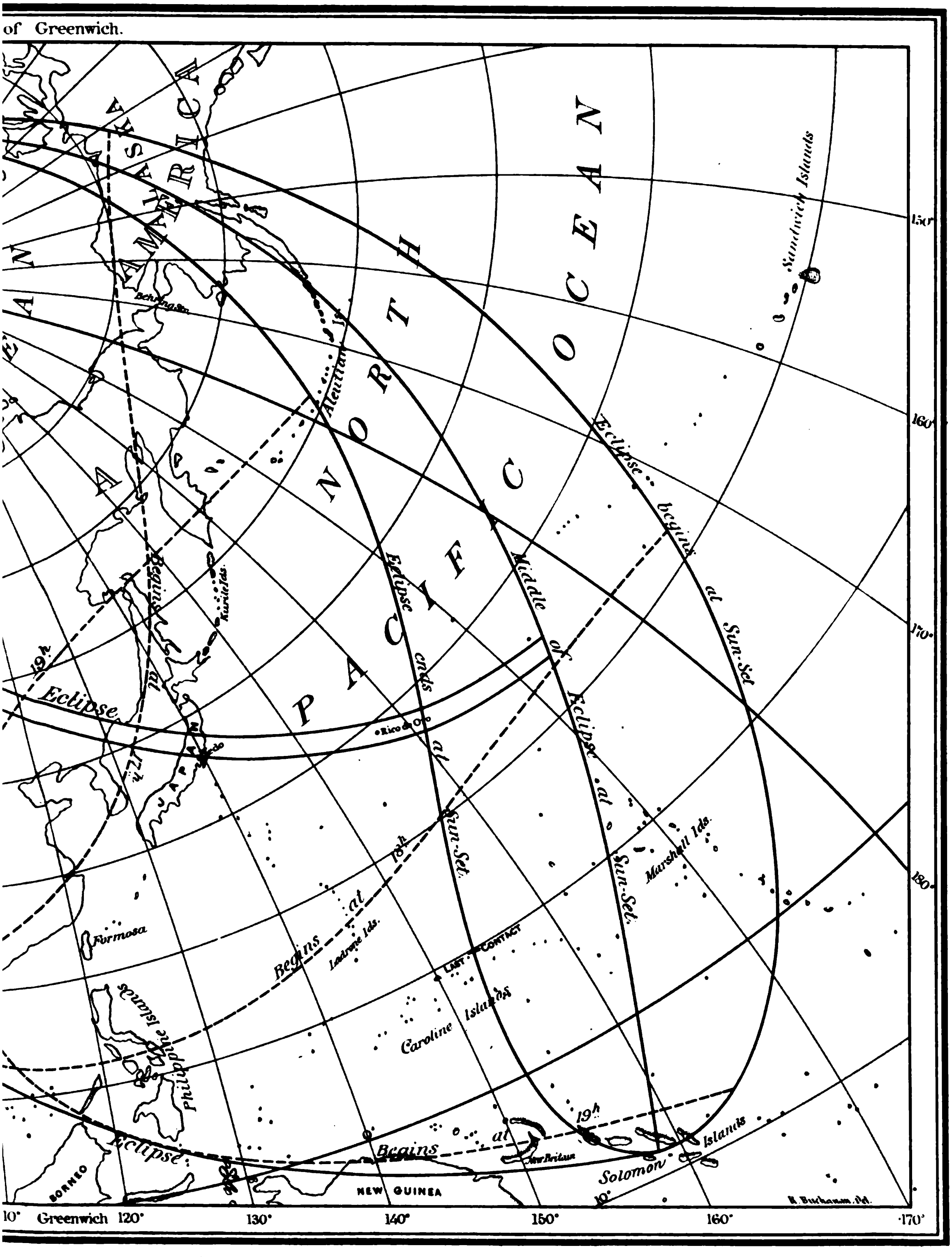
TOTAL ECLIPSE



Note:- *The hours of beginning and ending*

OF AUGUST 18TH 1887.



g are expressed in Greenwich Mean Time.

PATH OF THE SHADOW DURING THE TOTAL ECLIPSE OF THE SUN, 1887, AUGUST 18.

Greenwich Mean Time.	Northern Limit of Shadow Path.		Central Line.		Southern Limit of Shadow Path.		Duration of Shadow on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
	° ′	° ′	° ′	° ′	° ′	° ′	m s
Limits	+52 13.0	10 44.5 E.	+51 38.3	11 15.8 E.	+50 53.3	12 0.9 E.	
16^h 15^m	56 14.9	29 9.2	55 53.8	32 24.8	55 32.8	35 40.5	2 20.7
20	58 3.2	41 40.0	57 24.7	43 55.4	56 46.3	46 10.9	2 35.8
25	58 55.0	50 56.2	58 8.2	52 40.6	57 21.5	54 25.0	2 47.5
30	+59 18.5	58 41.5	+58 26.6	60 3.2	+57 34.8	61 25.0	2 57.3
35	59 23.4	65 29.4	58 28.3	66 32.3	57 33.2	67 35.2	3 5.8
40	59 15.3	71 33.8	58 18.0	72 20.3	57 20.8	73 6.9	3 13.3
45	58 56.4	77 3.9	57 57.9	77 36.2	56 59.3	78 8.4	3 19.9
50	58 29.4	82 6.2	57 30.1	82 25.7	56 30.9	82 45.2	3 25.7
55	57 55.4	86 43.8	56 56.0	86 52.0	55 56.6	87 0.3	3 30.8
17 0	+57 15.8	91 0.2	+56 16.6	90 58.6	+55 17.4	90 56.9	3 35.2
5	56 31.3	94 58.1	55 32.6	94 47.7	54 33.9	94 37.4	3 39.0
10	55 42.7	98 39.8	54 44.7	98 21.7	53 46.7	98 3.7	3 42.1
15	54 50.4	102 7.3	53 53.5	101 42.5	52 56.6	101 17.7	3 44.5
20	53 55.0	105 22.5	52 59.2	104 51.8	52 3.5	104 21.0	3 46.3
25	52 56.7	108 27.2	52 2.2	107 51.3	51 7.7	107 15.3	3 47.5
30	+51 55.9	111 22.7	+51 2.6	110 42.2	+50 9.4	110 1.7	3 48.0
35	50 52.8	114 10.4	50 0.9	113 25.8	49 9.1	112 41.1	3 48.0
40	49 47.3	116 51.6	48 56.8	116 3.4	48 6.4	115 15.1	3 47.3
45	48 39.7	119 27.9	47 50.8	118 36.4	47 1.8	117 44.9	3 46.0
50	47 30.0	122 0.3	46 42.6	121 6.0	45 55.2	120 11.6	3 44.1
55	46 18.2	124 30.1	45 32.4	123 33.1	44 46.6	122 36.0	3 41.5
18 0	+45 4.1	126 58.6	+44 20.0	125 59.1	+43 35.8	124 59.5	3 38.4
5	43 47.6	129 27.3	43 5.1	128 25.4	42 22.7	127 23.4	3 34.6
10	42 28.5	131 58.0	41 47.8	130 53.6	41 7.1	129 49.2	3 30.2
15	41 6.7	134 32.6	40 27.9	133 25.8	39 49.1	132 18.9	3 25.2
20	39 41.7	137 13.4	39 4.8	136 3.9	38 28.0	134 54.4	3 19.5
25	38 12.5	140 3.6	37 37.8	138 51.1	37 3.1	137 38.5	3 13.1
30	+36 38.2	143 7.7	+36 5.9	141 51.5	+35 33.7	140 35.2	3 5.8
35	34 57.2	146 32.8	34 27.7	145 11.6	33 58.2	143 50.4	2 57.5
40	33 6.6	150 31.3	32 40.7	149 2.4	32 14.9	147 33.6	2 47.8
45	30 59.8	155 30.4	30 39.3	153 47.7	30 18.8	152 5.0	2 36.3
50	28 15.5	162 59.5	28 6.8	160 37.2	27 58.1	158 14.9	2 21.1
Limits	+25 9.0	173 54.7 E.	+24 27.1	173 30.1 E.	+23 42.7	173 3.0 E.	

WASHINGTON MEAN TIME.

PHASES OF THE MOON.

New Moon.	d	h	m	First Quarter.	d	h	m	Full Moon.	d	h	m	Last Quarter.	d	h	m
				January	1	19	12.3	January	9	5	24.0	January	15	22	13.8
January	23	9	52.9	January	31	15	18.6	February	7	17	5.9	February	14	8	23.8
February	22	4	32.1	March	2	7	59.5	March	9	3	25.7	March	15	20	33.9
March	23	23	1.5	March	31	20	44.6	April	7	12	30.8	April	14	10	55.6
April	22	15	45.0	April	30	5	52.1	May	6	20	53.3	May	14	3	9.3
May	22	5	57.3	May	29	12	11.4	June	5	5	29.9	June	12	20	26.6
June	20	17	44.6	June	27	16	52.9	July	4	15	25.9	July	12	13	48.8
July	20	3	41.8	July	26	21	22.1	August	3	3	31.9	August	11	6	28.2
August	18	12	30.4	August	25	3	12.8	September	1	18	4.4	September	9	21	55.0
September	16	20	51.6	September	23	11	55.6	October	1	10	39.1	October	9	11	49.0
October	16	5	26.8	October	23	0	37.6	October	31	4	22.6	November	7	23	53.7
November	14	15	0.1	November	21	17	34.8	November	29	22	11.9	December	7	10	2.5
December	14	2	13.1	December	21	13	53.0	December	29	15	6.0				

PERIGEE, APOGEE, AND GREATEST LIBRATION.

Perigee.	d	h	Apogee.	d	h	Greatest Libration.	d	h	m			d	h	m	
January	11	12.9	January	27	13.6	January	5	52	35	E.	January	18	18	8	W.
February	8	19.3	February	24	0.9	February	2	59	37	E.	February	15	5	16	W.
March	9	7.0	March	23	1.7	March	3	6	55	E.	March	15	9	11	W.
April	6	18.6	April	19	9.4	March	31	11	29	E.	April	12	16	14	W.
May	5	1.2	May	17	0.9	April	28	4	57	E.	May	10	17	21	W.
June	1	18.2	June	13	18.9	May	24	57	6	E.	June	7	16	53	W.
June	27	13.9	July	11	13.4	June	20	7	49	E.	July	4	4	26	W.
July	23	12.9	August	8	7.4	July	17	15	12	E.	July	31	8	22	W.
August	20	7.2	September	4	22.1	August	14	11	53	E.	August	27	2	32	W.
September	17	13.7	October	2	4.9	September	11	15	46	E.	September	23	56	24	W.
October	16	0.7	October	29	6.1	October	9	58	5	E.	October	22	0	40	W.
November	13	11.6	November	25	16.1	November	7	0	43	E.	November	19	7	8	W.
December	11	17.0	December	23	10.5	December	4	9	33	E.	December	17	10	12	W.
						December	30	12	22	E.					

FORMULÆ FOR THE LIBRATION OF THE MOON.

Put I, the inclination of the moon's equator to the ecliptic ($= 1° 28'.8$),

Ω, the mean longitude of the moon's ascending node, (see page 278), or the mean longitude of the descending node of the moon's equator,

C, the angle at the centre of the moon's disk made by a lunar meridian with the circle of declination, counted from north to east on the apparent disk,

λ, β, α', δ', the apparent longitude, latitude, right ascension, and declination of the moon, corrected for parallax,

λ', the selenocentric longitude of the earth, counted on the moon's equator from its descending node, Ω,

i, Δ, Ω', ☾, the quantities defined on page 276, where their values for the year are given.

The moon's libration in longitude and latitude may then be found, for any time, by means of the following formulæ, in connection with the tables given on pages 276 and 277: —

$$\left.\begin{aligned} \Delta\lambda &= -0'.57 \sin 2(\Omega-\lambda) \\ a &= \sin I \cos(\Omega-\lambda) \\ \tan B &= \tan I \sin(\Omega-\lambda) \\ \lambda' &= \lambda+\Delta\lambda+a\,b \end{aligned}\right\}\ \textit{See table, page 277.}$$

$$\text{The libration in latitude} = b = B - \beta$$

$$\text{The libration in longitude} = l = \lambda' - \text{☾}$$

$$\sin C = \sin i\,\frac{\cos(\lambda' + \Delta - \Omega)}{\cos\delta'} = -\sin i\,\frac{\cos(\alpha' - \Omega'}{\cos b}$$

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0. Δα	Red'ns from 1887.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
10 Ceti	6	-0.63	- 5.8	- 0 40.6	1 4 8.2	- 1 27.8	-0.3536	0.5163	+0.1794	+16	-58
14 Ceti	6	0.58	6.3	1 7.7	8 54.3	+ 3 10.2	+1.0000	0.5162	0.1796	+89	+23
15 Ceti	6½	0.57	6.4	- 1 7.7	10 16.2	+ 4 29.7	+1.2460	0.5164	0.1798	+89	+45
33 Ceti	6	0.36	6.6	+ 1 50.6	2 3 30.2	- 2 46.0	+1.0640	0.5200	0.1790	+90	+28
35 Ceti	6½	0.35	6.6	1 52.4	4 32.6	- 1 45.3	+1.2161	0.5200	0.1784	+90	+42
f Piscium	5	-0.31	- 6.4	+ 3 1.0	7 18.6	+ 0 55.8	+0.4553	0.5206	+0.1782	+64	-10
μ Piscium	5	0.23	6.0	5 33.5	13 45.2	+ 7 11.2	-1.1880	0.5229	0.1767	-39	-84
ν Piscium	4½	-0.17	6.5	4 54.8	19 37.5	-11 6.9	+0.5520	0.5253	0.1749	+72	- 4
64 Ceti	5½	+0.01	6.4	8 2.3	3 10 54.7	+ 3 43.1	-0.2242	0.5310	0.1682	+23	-46
ξ^1 Ceti	4½	0.03	6.4	8 18.9	11 44.1	+ 4 31.0	-0.3870	0.5316	0.1678	+14	-57
B. A. C. 755	6½	+0.09	- 6.3	+10 3.2	18 36.7	+11 11.1	+1.1260	0.5348	+0.1637	-34	-80
ξ^2 Ceti	4½	0.11	6.9	7 57.1	19 20.2	+11 53.1	+1.2635	0.5351	0.1635	+90	+52
B. A. C. 830	6	0.18	6.7	10 15.4	4 2 23.2	- 3 16.9	-0.0916	0.5389	0.1586	+30	-36
μ Ceti	4½	0.20	6.9	9 38.1	3 35.1	- 2 7.1	+0.7667	0.5404	0.1575	+90	+12
Lalande 5725	6	0.31	6.6	12 45.1	13 56.6	+ 5 54.6	-0.9910	0.5466	0.1489	-23	-77
f Tauri	4	+0.43	- 7.1	+12 32.8	5 1 30.9	- 6 53.6	+0.8831	0.5540	+0.1369	+90	+22
48 Tauri	6	0.62	7.5	15 7.1	21 54.7	-11 11.2	+0.6987	0.5680	0.1113	+90	+13
γ Tauri	4	0.64	7.4	15 21.1	23 41.4	- 9 28.2	+0.6469	0.5690	0.1086	+84	+10
δ^1 Tauri	4	0.63	7.2	17 16.6	6 1 2.6	- 8 9.8	-1.2240	0.5692	0.1067	-48	-73
63 Tauri	6	0.65	7.4	16 30.6	1 16.2	- 7 56.7	-0.3962	0.5693	0.1067	+13	-50
δ^3 Tauri	5½	+0.66	- 7.3	+17 10.8	1 33.4	- 7 40.1	-1.0670	0.5701	+0.1056	-31	-73
70 Tauri	6½	0.66	7.6	15 40.8	2 15.4	- 6 59.6	+0.5777	0.5702	0.1051	+76	+ 7
71 Tauri	6	0.65	7.7	15 21.5	2 35.0	- 6 40.6	+0.9477	0.5711	0.1042	+90	+30
75 Tauri	6½	0.66	7.6	16 6.3	3 29.6	- 5 48.0	+0.2595	0.5711	0.1024	+51	-11
θ^1 Tauri	4	0.66	7.7	15 42.5	3 33.5	- 5 44.2	+0.6811	0.5711	0.1024	+89	+13
θ^2 Tauri	4	+0.67	- 7.6	+15 37.0	3 35.8	- 5 42.0	+0.7803	0.5711	+0.1024	+90	+19
80 Tauri	6½	0.66	7.7	15 23.2	4 14.9	- 5 4.3	+1.0860	0.5711	0.1021	+90	+41
B. A. C. 1391	5	0.67	7.7	15 56.7	4 25.2	- 4 54.4	+0.5208	0.5716	0.1010	+70	+ 4
81 Tauri	6½	0.66	7.7	15 26.6	4 28.2	- 4 51.5	+1.0510	0.5716	0.1010	+90	+38
85 Tauri	6½	0.66	7.7	15 36.4	4 59.9	- 4 20.9	+0 9337	0.5723	0.1007	+90	+29
α Tauri	1	+0.69	- 7.6	+16 16.8	6 45.5	- 2 39.0	+0 4034	0.5729	+0 0977	+61	- 3
σ^2 Tauri	5	0.70	7.9	15 41.5	8 13.5	- 1 14.1	+1.1600	0.5742	0.0960	+90	+49
B. A. C. 1526	5½	0.74	8.1	16 58.4	15 59.9	+ 6 15.6	+0.5156	0.5791	0.0827	+70	+ 5
m Tauri	5½	0.77	8.0	18 29.5	20 13.1	+10 19.4	-0.7254	0.5822	0.0757	- 7	-72
111 Tauri	5½	0.80	8.4	17 16.5	7 3 23.4	- 6 46.1	+1.0240	0.5865	0.0617	+90	+40
115 Tauri	6	+0.81	- 8.5	+17 51.8	4 32.0	- 5 40.5	+0.4862	0.5865	+0.0598	+68	+ 6
119 Tauri	5	0.82	8.5	18 30.4	6 37.1	- 3 39.7	-0.0549	0.5885	0 0559	+32	-23
120 Tauri	6	0.82	8.5	18 27.4	7 9.7	- 3 8.3	+0.0274	0.5888	0.0552	+37	-19
127 Tauri	6½	0.84	8.7	18 55.3	11 1.1	+ 0 34.4	-0.2530	0.5902	0.0477	+21	-34
130 Tauri	6	0.86	8.7	17 41.1	12 54.7	+ 2 23.8	+1.1030	0.5919	0.0438	+90	+49
χ^2 Orionis	6	+0.86	- 9.0	+19 43.5	15 56.4	+ 5 18.5	-0.8654	0.5934	+0.0377	-16	-70
χ^3 Orionis	6	0.87	9.2	19 41.4	19 24.2	+ 8 38.3	-0.7086	0.5953	0.0300	- 7	-69
χ^4 Orionis	5	0.87	9.2	20 8.3	19 35.1	+ 8 48.8	-1.1610	0.5953	0.0298	-42	-70
68 Orionis	6	0.89	9.2	19 48.8	22 52.3	+11 58.5	-0.7401	0.5960	0.0234	- 8	-70
71 Orionis	6	0.90	9.2	19 11.4	8 0 1.9	-10 54.6	-0.0781	0.5965	0.0212	+30	-21
ν Geminorum	4½	+0.89	- 9.5	+20 16.8	5 40.7	- 5 28.9	-1.1020	0.5993	+0.0088	-36	-70
f Geminorum	6	0.89	9.9	17 55.7	9 9 40.8	- 2 34.9	+0.6784	0.6047	-0.0519	+90	+18
g Geminorum	5½	0.88	9.9	18 46.9	12 17.4	- 0 4.5	-0.3211	0.6040	0.0569	+17	-39
3 Cancri	6	0.86	10.0	17 36.8	18 5.4	+ 5 29.8	+0.4807	0.6040	0.0695	+68	+ 5
ζ^1 Cancri	4½	0.84	10.0	17 59.0	22 35.4	- 0 10.9	-0.2216	0.6033	0.0792	+22	-35
d^2 Cancri	6	+0.81	- 9.8	+17 24.9	10 4 0.1	- 8 59.0	-0.1114	0.6025	-0.0897	+29	-29
54 Cancri	6½	0.76	9.5	15 45.9	14 2.3	+ 0 39.5	+0.5350	0.6007	0.1090	+72	+ 4
o^1 Cancri	5½	0.74	9.5	15 45.2	16 30.8	+ 3 2.2	+0.2707	0.6003	0.1139	+52	-14
o^2 Cancri	6	0.76	9.5	16 0.7	16 38.7	+ 3 9.7	-0.0017	0.5995	0.1139	+35	-25
π^1 Cancri	6½	0.71	9.3	15 26.8	22 34.9	+ 8 52.1	-0.1462	0.5988	0.1139	+26	-34
π^2 Cancri	6	+0.70	- 9.2	+15 24.4	23 44.4	+ 9 58.9	-0.2521	0.5974	-0.1264	+21	-41
7 Leonis	6½	+0.66	- 9.1	+14 52.9	11 8 6.4	- 5 58.4	-0.8441	0.5966	-0.1398	-14	-75

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
ψ Leonis	6	+0.62	-8.7	+14 32.1	11 11 18.5	- 2 53.7	-0.9552	0.5932	-0.1444	-21	-75
18 Leonis	6	0.63	8.3	12 19.7	12 25.0	- 1 49.8	+1.0810	0.5928	0.1468	+90	+36
23 Leonis	6½	0.61	8.5	13 35.5	14 18.3	- 0 0.7	-0.4577	0.5923	0.1488	+10	-57
ν Leonis	5½	0.58	8.2	12 58.9	17 16.0	+ 2 50.3	-0.2968	0.5907	0.1529	+18	-46
α Leonis	1½	0.55	7.9	12 31.0	21 28.2	+ 6 52.8	-0.4893	0.5857	0.1589	+ 8	-60
45 Leonis	6	+0.49	-7.2	+10 20.2	12 5 29.9	- 9 23.5	+0.3671	0.5857	-0.1687	+58	-12
ρ Leonis	4	0.47	6.8	9 53.2	7 39.8	- 7 18.3	+0.4485	0.5851	0.1708	+64	- 8
49 Leonis	6	0.47	6.6	9 14.0	8 36.3	- 6 23.9	+0.9387	0.5851	0.1718	+90	+23
χ Leonis	4½	0.36	5.5	7 56.7	21 20.3	+ 5 52.1	-0.0383	0.5781	0.1828	+33	-35
σ Leonis	4	0.30	4.6	6 38.8	13 4 15.0	-11 28.2	-0.0233	0.5768	0.1879	+34	-35
b Virginis	6	+0.15	-2.7	+ 4 17.0	21 9.4	+ 4 50.1	-0.9061	0.5710	-0.1953	-16	-86
10 Virginis	6½	+0.10	-1.9	+ 2 32.0	14 1 26.7	+ 8 58.3	+0.0135	0.5689	0.1959	+36	-34
γ Virginis *mult.*	2½	-0.03	+0.3	- 0 49.8	15 40.6	- 1 17.4	+0.6043	0.5652	0.1968	+77	- 2
46 Virginis	6	0.12	1.5	2 45.6	15 0 7.2	+ 6 51.6	+0.9036	0.5636	0.1952	+87	+16
48 Virginis	6½	0.12	1.7	3 3.3	1 36.3	+ 8 17.8	+0.9137	0.5632	0.1946	+87	+17
65 Virginis	6	-0.22	+2.8	- 4 20.0	10 20.0	- 7 16.5	+0.5288	0.5624	-0.1915	+69	- 6
66 Virginis	6	0.23	2.9	4 34.4	10 52.8	- 6 44.8	+0.6677	0.5622	0.1912	+82	+ 2
*l*² Virginis	5	0.25	3.6	5 40.3	14 14.0	- 3 30.4	+1.1490	0.5622	0.1898	+84	+35
80 Virginis	6	0.28	3.4	4 49.2	15 50.2	- 1 57.5	-0.0221	0.5622	0.1888	+33	-36
88 Virginis	6½	0.34	4.2	6 16.3	21 36.0	+ 3 36.5	+0.3815	0.5616	0.1856	+57	-14
B. A. C. 4647	6½	-0.38	+4.9	- 7 30.0	16 0 36.8	+ 6 31.2	+1.0810	0.5616	-0.1837	+83	+30
94 Virginis	6½	0.42	5.4	8 21.0	5 43.0	+11 26.9	+1.0270	0.5615	0.1799	+82	+25
ξ¹ Libræ	6	0.66	7.3	11 26.1	17 3 24.2	+ 8 23.8	+0.5154	0.5618	0.1595	+66	- 7
ξ² Libræ	5½	0.68	7.2	10 57.1	4 28.9	+ 9 26.2	-0.1551	0.5618	0.1582	+22	-44
17 Libræ	7	0.70	7.2	10 41.8	5 9.7	+10 5.6	-0.5276	0.5618	0.1578	+ 2	-70
18 Libræ	6½	-0.71	+7.1	-10 41.3	5 27.0	+10 22.3	-0.5811	0.5619	-0.1570	- 1	-75
B. A. C. 5070	6	0.82	8.0	11 57.8	16 39.8	- 2 47.9	-0.9550	0.5623	0.1439	-26	-90
γ Libræ	4½	0.88	8.7	14 24.6	21 50.8	+ 2 12.4	+0.8610	0.5637	0.1372	+76	+15
48 Libræ	5½	1.00	8.7	13 57.1	18 7 59.8	-11 59.6	-0.9388	0.5657	0.1234	-27	-90
W.(²) xvi. 140	6½	1.09	8.8	14 33.7	15 51.8	- 4 23.9	-1.2260	0.5661	0.1113	-55	-90
φ Ophiuchi	4½	-1.16	+9.1	-16 21.7	22 38.0	+ 2 8.2	-0.0561	0.5672	-0.1007	+22	-38
24 Scorpii	5½	1.22	9.3	17 31.1	19 3 14.6	+ 6 35.0	+0.7169	0.5675	0.0937	+72	+ 7
29 Ophiuchi	6½	1.31	9.3	18 42.9	12 12.9	- 8 45.2	+1.1212	0.5684	0.0787	+71	+48
B. A. C. 6294	5½	1.63	+6.7	18 28.7	21 4 0.3	+ 5 39.1	-0.7549	0.5670	-0.0072	-27	-90
				NEW	*MOON.*						
*e*² Aquarii	5½	-1.57	-4.2	-12 7.3	25 11 47.4	+10 3.5	+0.2266	0.5321	+0.1440	+43	-23
σ Aquarii	5	1.50	5.1	11 15.5	22 3.6	- 3 58.8	+0.3173	0.5285	0.1526	+79	+10
58 Aquarii	6½	1.50	5.2	11 29.1	22 35.4	- 3 27.8	+1.1290	0.5280	0.1531	+79	+35
λ Aquarii	4	1.40	5.6	8 10.9	26 9 29.4	+ 7 6.9	-0.8191	0.5248	0.1611	-14	-90
78 Aquarii	6½	-1.40	-5.7	- 7 48.4	10 30.8	+ 8 6.5	-1.0700	0.5244	+0.1618	-31	-90
81 Aquarii	6½	1.36	6.0	7 40.2	14 5.6	+11 35.1	-0.6396	0.5232	0.1636	- 3	-81
82 Aquarii	6½	1.35	6.0	7 11.0	14 41.9	-11 49.7	-1.0800	0.5231	0.1640	-32	-90
*h*¹ Aquarii	5½	1.35	6.3	8 18.3	16 3.6	-10 30.4	+0.3900	0.5229	0.1647	+57	-14
φ Aquarii	4½	1.30	6.3	6 39.6	20 54.4	- 5 48.0	-0.6304	0.5216	0.1673	- 1	-80
96 Aquarii	5½	-1.27	-6.3	- 5 44.6	23 35.3	- 3 11.7	-1.1960	0.5206	+0.1688	-41	-90
B. A. C. 8184	6½	1.22	6.7	5 9.1	27 4 58.2	+ 2 1.9	-0.9390	0.5193	0.1710	-20	-90
20 Piscium	5½	1.13	7.0	3 23.5	14 47.8	+11 34.8	-1.1900	0.5175	0.1747	-40	-90
24 Piscium	6½	1.11	7.3	3 47.1	17 27.8	- 9 49.8	-0.2884	0.5174	0.1755	+19	-52
27 Piscium	5	1.09	7.5	4 11.1	20 33.2	- 6 49.7	+0.6969	0.5166	0.1764	+85	+ 3
29 Piscium	5	-1.07	-7.5	- 3 39.5	22 14.3	- 5 11.4	+0.4123	0.5164	+0.1768	+60	-13
4 Ceti	6	1.04	7.6	3 10.7	28 1 24.8	- 2 6.3	+0.4418	0.5160	0.1775	+63	-11
5 Ceti	6	1.04	7.6	3 4.8	1 39.9	- 1 51.7	+0.3771	0.5160	0.1775	+58	-14
B. A. C. 5	5½	1.04	7.6	2 51.3	1 56.3	- 1 35.7	+0.1756	0.5160	0.1775	+45	-25
10 Ceti	6	0.94	7.6	0 40.6	11 33.3	+ 7 45.0	-0.5268	0.5160	0.1790	+ 6	-69
14 Ceti	6	-0.89	-8.0	- 1 7.7	16 21.0	-11 35.5	+0.8337	0.5160	+0.1794	+89	+12
15 Ceti	6½	-0.88	-8.1	- 1 7.7	17 43.2	-10 15.6	+1.0800	0.5164	+0.1794	+89	+29

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
29 Ceti	6½	-0.72	- 8.4	+ 1 24.1	29 9 43.7	+ 5 17.6	+1.1380	0.5169	+0.1780	+90	+34
33 Ceti	6	0.69	8.4	1 50.6	11 6.2	+ 6 37.8	+0.8950	0.5170	0.1779	+90	+16
35 Ceti	6½	0.69	8.4	1 52.4	12 9.2	+ 7 39.0	+1.0500	0.5174	0.1775	+90	+27
f Piscium	5	0.65	8.3	3 1.0	14 57.2	+10 22.3	+0.2836	0.5184	0.1773	+52	-19
ν Piscium	4½	0.52	8.2	4 54.8	30 3 26.1	- 1 30.5	+0.3816	0.5214	0.1736	+58	-14
64 Ceti	5½	-0.35	- 8.1	+ 8 2.3	18 59.5	-10 24.3	-0.3960	0.5259	+0.1668	+13	-58
ξ^1 Ceti	4½	0.34	8.0	8 18.9	19 49.9	- 9 35.4	-0.5603	0.5261	0.1664	+ 4	-71
B. A. C. 755	6½	0.26	7.8	10 3.2	31 2 51.0	- 2 46.8	-1.3160	0.5286	0.1622	-60	-80
ξ^2 Ceti	4½	0.27	8.6	7 57.1	3 35.3	- 2 3.9	+1.1080	0.5290	0.1617	+90	+34
B. A. C. 830	6	0.17	8.1	10 15.4	10 47.8	+ 4 55.6	-0.2555	0.5323	0.1567	+21	-47
μ Ceti	4½	-0.16	- 8.4	+ 9 38.1	12 1.3	+ 6 6.9	+0.6124	0.5331	+0.1560	+78	+ 2
Lalande 5725	6	-0.02	- 7.7	+12 45.1	22 38.0	- 7 36.1	-1.1570	0.5386	+0.1472	-38	-77
FEBRUARY.											
f Tauri	4	+0.10	- 8.2	+12 32.8	1 10 30.2	+ 3 53.7	+0.7442	0.5451	+0.1354	+90	+13
48 Tauri	6	0.32	8.3	15 7.1	2 7 26.4	+ 0 8.5	+0.5778	0.5590	0.1099	+76	+ 7
γ Tauri	4	0.36	8.3	15 21.1	9 16.0	+ 1 54.4	+0.5302	0.5601	0.1081	+71	+ 3
58 Tauri	6½	0.34	8.5	14 49.4	9 38.8	+ 2 16.4	+1.1310	0.5609	0.1073	+90	+44
63 Tauri	6	0.37	8.0	16 30.6	10 53.4	+ 3 28.5	-0.5238	0.5611	0.1054	+ 5	-58
δ^2 Tauri	5½	+0.38	- 7.8	+17 10.8	11 11.0	+ 3 45.4	-1.2030	0.5614	+0.1053	-46	-73
70 Tauri	6½	0.38	8.3	15 40.8	11 54.1	+ 4 27.1	+0.4604	0.5620	0 1041	+65	0
71 Tauri	6	0.38	8.4	15 21.5	12 14.2	+ 4 46.6	+0.8360	0.5622	0.1041	+90	+22
75 Tauri	6½	0.39	8.2	16 6.3	13 10.2	+ 5 40.6	+0.1426	0.5622	0.1025	+44	-17
θ^1 Tauri	4	0.39	8.4	15 42.5	13 14.0	+ 5 44.3	+0.5669	0.5622	0.1025	+75	+ 7
θ^2 Tauri	4	+0.39	- 8.4	+15 37.0	13 16.6	+ 5 46.8	+0.6673	0 5622	+0.1025	+87	+12
80 Tauri	6½	0.39	8.5	15 23.2	13 56.8	+ 6 25.6	+0.9788	0.5633	0.1013	+90	+32
B. A. C. 1391	5	0.40	8.4	15 56.7	14 7.4	+ 6 35.8	+0.4067	0.5633	0.1011	+61	- 3
81 Tauri	6½	0.40	8.5	15 26.6	14 10.4	+ 6 38.8	+0.9419	0.5635	0.1011	+90	+30
85 Tauri	6½	0.40	8.5	15 36.4	14 42.8	+ 7 10.1	+0.8222	0.5639	0.1000	+90	+22
α Tauri	1	+0.42	- 8.4	+16 16.8	16 31.2	+ 8 54.8	+0.1452	0.5639	+0.0970	+53	- 8
σ^1 Tauri	5	0.44	8.6	15 34.5	17 58.8	+10 19.3	+1.1720	0.5653	0.0951	+90	+50
σ^2 Tauri	5	0.44	8.5	15 41.5	18 1.6	+10 22.0	+1.0540	0.5653	0.0949	+90	+38
B. A. C. 1526	5½	0.52	8.5	16 58.4	3 1 59.5	- 5 56.7	+0.4119	0.5707	0.0824	+62	- 1
m Tauri	5½	0.57	8.3	18 29.5	6 18.9	- 1 46.6	-0.8345	0.5740	0.0756	-14	-72
111 Tauri	5½	+0.64	- 8.9	+17 16.5	13 39.0	+ 5 17.7	+0.9376	0.5790	+0.0622	+90	+33
115 Tauri	6	0.65	8.7	17 51.8	14 49.0	+ 6 25.1	+0.3971	0.5793	0.0602	+61	+ 1
117 Tauri	6½	0.65	9.0	17 8.6	15 11.8	+ 6 47.0	+1.1660	0.5795	0.0599	+90	+53
119 Tauri	5	0.67	8.7	18 30.4	16 56.9	+ 8 28.3	-0.1451	0.5803	0.0565	+27	-28
120 Tauri	6	0.68	8.7	18 27.4	17 30.2	+ 9 0.4	-0.0536	0.5811	0.0549	+32	-23
127 Tauri	6½	+0.71	- 8.7	+18 55.3	21 26.3	-11 12.2	-0.3414	0.5816	+0.0476	+16	-40
130 Tauri	6	0.73	9.1	17 41.1	23 21.9	- 9 29.1	+1.0280	0.5848	0.0448	+90	+41
χ^2 Orionis	6	0.76	8.6	19 43.5	4 2 27.1	- 6 22.7	-0.9519	0.5872	0.0382	-23	-71
χ^3 Orionis	6	0.79	8.7	19 41.4	5 58.7	- 2 59.0	-0.7894	0.5884	0.0315	-11	-71
68 Orionis	6	0.82	8.8	19 48.7	9 30.1	+ 0 24.5	-0.8155	0.5911	0.0239	-13	-71
71 Orionis	6	+0.82	- 9.1	+19 11.4	10 40.8	+ 1 32.5	-0.1487	0.5920	+0.0219	+26	-25
ν Geminorum	4½	0.87	8.9	20 16.8	16 24.4	+ 7 2.9	-1.1680	0.5942	+0.0095	-44	-70
f Geminorum	6	1.02	10.2	17 55.7	5 20 35.8	+10 8 4	+0.6462	0.6022	-0.0506	+85	+16
g Geminorum	5½	1.03	10.1	18 46.9	23 12.3	-11 21.4	-0.3455	0.6045	0.0558	+16	-40
3 Cancri	6	1.05	10.3	17 36.8	6 4 59.5	- 5 47.9	+0.4609	0.6046	0.0684	+66	+ 4
ζ^1 Cancri	4½	+1.07	-10.3	+17 59.0	9 28.2	- 1 29.8	-0.2358	0.6052	-0.0782	+22	-35
d^2 Cancri	6	1.08	10.6	17 24.9	14 50.3	+ 3 39.4	-0.1176	0.6047	0.0891	+28	-30
54 Cancri	6½	1.09	10.8	15 45.9	7 0 45.6	-10 49.0	+0.5362	0.6049	0.1087	+72	+ 5
o^1 Cancri	5½	1.09	10.8	15 45.2	3 12.1	- 8 28.3	+0.2751	0.6043	0.1130	+52	-10
o^2 Cancri	6	1.09	10.8	16 0.7	3 19.8	- 8 20.9	+0.0033	0.6043	0.1131	+35	-25
π^1 Cancri	6½	+1.09	-10.8	+15 26.8	9 10.1	- 2 44.5	-0.1315	0 6038	-0.1242	+27	-34
π^2 Cancri	6	+1.09	-10.7	+15 24.4	10 18.4	- 1 38.9	-0.2352	0.6035	-0.1262	+22	-40

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
7 Leonis	6½	+1.08	-10.5	+14 52.8	7 18 30.2	+ 6 13.5	-0.8095	0.6017	-0.1410	-12	-75
ψ Leonis	6	1.07	10.5	14 32.0	21 37.9	+ 9 13.9	-0.9147	0.6005	0.1455	-19	-76
18 Leonis	6	1.07	10.3	12 19.6	22 42.9	+10 16.3	+1.0980	0.6003	0.1472	+90	+38
23 Leonis	6½	1.07	10.4	13 35.4	8 0 33.3	-11 57.6	-0.4180	0.5999	0.1502	+12	-55
ν Leonis	5½	1.06	10.2	12 58.8	3 26.5	- 9 11.1	-0.2590	0.5993	0.1546	+20	-45
α Leonis	1½	+1.05	-10.1	+12 30.9	7 32.2	- 5 15.0	-0.4451	0.5977	-0.1600	+11	-57
45 Leonis	6	1.03	9.7	10 20.1	15 19.9	+ 2 14.7	+0.4076	0.5954	0.1700	+61	- 9
ρ Leonis	4	1.02	9.5	9 53.1	17 26.0	+ 4 16.0	+0.4893	0.5946	0.1726	+67	- 5
49 Leonis	6	1.03	9.5	9 13.9	18 20.7	+ 5 8.5	+0.9738	0.5946	0.1735	+90	+25
χ Leonis	4½	0.96	8.7	7 56.7	9 6 39.5	- 7 0.8	+0.0213	0.5895	0.1858	+36	-31
σ Leonis	4	+0.93	- 8.2	+ 6 38.8	13 19.8	- 0 35.4	+0.0410	0.5880	-0.1909	+37	-31
b Virginis	6	0.84	6.7	4 16.9	10 5 37.4	- 8 54.0	-0.8124	0.5821	0.1986	-10	-86
10 Virginis	6½	0.82	6.0	+ 2 31.9	9 45.2	- 4 55.3	+0.0939	0.5809	0.1996	+40	-30
γ Virginis *mult.*	2½	0.73	4.3	- 0 49.9	23 27.5	+ 8 17.3	+0.6820	0.5771	0.2003	+86	+ 3
46 Virginis	6	0.66	3.3	2 45.7	11 7 35.9	- 7 51.9	+0.9800	0.5748	0.1987	+87	+22
48 Virginis	6½	+0.65	- 3.1	- 3 3 4	9 1.9	- 6 29.0	+0.9899	0.5738	-0.1980	+87	+23
65 Virginis	6	0.58	2.0	4 20.0	17 27.6	+ 1 38.7	+0.6109	0.5731	0.1949	+77	- 2
66 Virginis	6	0.58	2.0	4 34.4	17 59.3	+ 2 9.3	+0.7479	0.5729	0.1946	+81	+ 7
l^2 Virginis	5	0.56	1.2	5 40.3	21 13.7	+ 5 16.8	+1.2250	0.5723	0.1930	+85	+43
80 Virginis	6	0.53	1.4	4 49.2	22 47.0	+ 6 46.9	+0.0703	0.5715	0.1920	+38	-31
88 Virginis	6½	+0.48	- 0.7	- 6 16.4	12 4 21.9	-11 50.1	+0.4698	0.5709	-0.1884	+36	-34
B. A C. 4647	6½	0.46	- 0.1	7 30.1	7 17.3	- 9 0.8	+1.1610	0.5703	0.1864	+83	+37
94 Virginis	6½	0.42	+ 0.4	8 21.1	12 14.5	- 4 14.1	+1.1060	0.5692	0.1823	+82	+32
ξ^1 Libræ	6	0.19	2.9	11 26.2	13 9 23.8	- 7 49.2	+0.6040	0.5684	0.1615	+71	- 2
ξ^2 Libræ	5½	0.18	2.6	10 57.2	10 27.3	- 6 48.0	-0.0597	0.5680	0.1604	+28	-39
17 Libræ	7	+0.17	+ 2.6	-10 41 9	11 7.2	- 6 9.4	-0.4283	0.5678	-0.1594	+ 8	-62
18 Libræ	6½	0.17	2.6	10 41.4	11 24.1	- 5 53.2	-0.4830	0 5674	0.1589	+ 5	-67
B. A. C. 5070	6	+0.03	3.8	11 57.8	22 25.1	+ 4 44.7	-0.8574	0.5674	0.1454	-19	-90
γ Libræ	4½	-0.02	5.0	14 24.6	14 3 31.5	+ 9 40.5	+0.9448	0.5674	0.1385	+76	+21
48 Libræ	5½	0.15	5.0	13 57.1	13 33.8	- 4 38.3	-0.8492	0.5674	0.1241	-21	-90
W.$^{(2)}$ xvi., 140	6½	-0.25	+ 5.4	-14 33.8	21 22.0	+ 2 53 6	-1.1360	0.5674	-0.1117	-44	-90
φ Ophiuchi	4½	0.33	6.2	16 21.8	15 4 6.0	+ 9 23.5	+0.0262	0.5674	0.1014	+26	-33
24 Scorpii	5½	0.37	6.7	17 31.2	8 41.8	-10 10.2	+0.7932	0.5670	0.0937	+73	+11
B. A. C. 6294	5½	0.98	5.8	18 28.7	17 9 41.0	-10 52.8	-0.7029	0.5630	-0.0077	-23	-90
Lalande 35497	6½	1.13	5.3	19 24.3	18 0 0.9	+ 2 57.8	+0.3694	0.5599	+0.0177	+38	-14
B. A. C. 6536	6	-1.15	+ 5.2	-19 27.9	2 23.8	+ 5 15.9	+0.4801	0.5599	+0.0224	+47	- 8
d Sagittarii	5	1.18	4.6	19 9.1	6 41.8	+ 9 25.0	+0.2531	0.5593	0.0293	+33	-22
ρ^1 Sagittarii	4	1.20	4.3	18 3.5	8 34.5	+11 14.2	-0.8752	0.5582	0.0325	-32	-90
ρ^2 Sagittarii	6½	1.20	4.4	18 30.9	8 38.4	+11 17.9	-0.3779	0.5582	0.0325	- 3	-60
B. A. C. 6707	6½	1.26	4.0	19 6.0	15 22.1	- 6 11.9	+0.5110	0.5564	0.0440	+52	- 6
B. A. C. 6710	6	-1.26	+ 3.9	-18 28.9	15 40.2	- 5 54.5	-0.1450	0.5562	+0.0444	+12	-44
57 Sagittarii	6	1.30	3.5	19 19.7	22 42.4	+ 0 53.9	+1.1320	0.5547	0.0560	+71	+39
ρ Capricorni	5½	1.41	1.7	18 11.1	19 16 2.9	- 6 19.6	+1.0950	0.5494	0.0828	+72	+34
B. A. C. 7063	6	1.44	+ 0.1	16 28.0	20 5 57.7	+ 7 8.6	+0.5000	0.5442	0.1022	+57	- 7
Lalande 40522	6	1.43	- 0.2	14 55.2	6 28.6	+ 7 38.4	-1.1490	0.5442	0.1031	-45	-90
				NEW	*MOON.*						
MARS				- 5 18.1	23 9 18.8	+ 8 14.1	-1.1750	0.4893	+0.1562	-40	-90
20 Piscium	5½	-1.26	- 7.5	3 23.5	21 24.9	- 4 0.7	-1.2060	0.5190	0.1752	-41	-90
24 Piscium	6½	1.26	7.8	3 47.1	24 0 4.7	- 1 25.4	-0.2982	0.5188	0.1760	+18	-53
27 Piscium	5	-1.24	- 8.1	- 4 11.1	3 10.2	+ 1 34.8	+0.6908	0.5184	+0.1767	+85	+ 3
29 Piscium	5	1.23	8.2	3 39.5	4 50.7	+ 3 12.5	+0.4019	0.5184	0.1771	+59	-13
4 Ceti	6	1.22	8.3	3 10.7	8 0.9	+ 6 17.3	+0.4315	0.5178	0.1778	+62	-12
5 Ceti	6	1.21	8.3	3 4.8	8 15.9	+ 6 31.9	+0.3667	0.5178	0.1778	+57	-15
B. A. C. 5	5½	1.21	8.3	2 51.3	8 32.4	+ 6 48.0	+0.1629	0.5175	0.1780	+44	-26
10 Ceti	6	-1.14	- 8.5	- 0 40.6	18 8.9	- 7 51.9	-0.5370	0.5174	+0.1793	+ 5	-71
14 Ceti	6	-1.12	- 8.9	- 1 7.7	22 56.3	- 3 12.6	+0.8222	0.5174	+0.1797	+89	+12

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0. Δα	Red'ns from 1887.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
15 Ceti	6½	-1.12	- 9.0	- 1 7 8	25 0 18.6	- 1 52.7	+1.0710	0.5174	+0.1797	+89	+29
29 Ceti	6½	1.01	9.5	+ 1 24.0	16 19.8	-10 18.8	+1.1330	0.5178	0.1784	+90	+34
33 Ceti	6	0.99	9.5	1 50.5	17 42.3	- 8 58.5	+0.8874	0.5180	0.1782	+90	+16
35 Ceti	6½	0.99	9.5	1 52.3	18 45.6	- 7 57.1	+1.0420	0.5182	0.1780	+90	+27
f Piscium	5	0.96	9.4	3 0.9	21 34.0	- 5 13.5	+0.2736	0.5189	0.1775	+51	-20
ν Piscium	4½	-0.86	- 9.6	+ 4 54.7	26 10 6.1	+ 6 57.1	+0.3757	0.5216	+0.1736	+58	-14
64 Ceti	5½	0.74	9.4	8 2.2	27 1 46.1	- 1 59.2	-0.4074	0.5238	0.1662	+12	-58
ξ¹ Ceti	4½	0.72	9.4	8 18.8	2 36.9	- 1 0.8	-0.5707	0.5241	0.1660	+ 3	-71
ξ² Ceti	4½	0.66	9.7	7 57.0	10 27.2	+ 6 35.5	+1.1126	0.5270	0.1612	+90	+34
B. A. C. 830	6	0.59	9.4	10 15.3	17 45.3	-10 19.3	-0.2614	0.5284	0.1562	+20	-47
μ Ceti	4½	-0.59	- 9.6	+ 9 38.0	19 0.0	- 9 6.9	+0 6151	0.5295	+0.1550	+79	+ 2
Lalande 5725	6	0.48	9.0	12 45.0	28 5 46.5	+ 1 20.0	-1.1690	0.5341	0.1462	-40	-77
f Tauri	4	-0.37	- 9.4	+12 32.7	17 52.3	- 0 56.6	+0.7543	0.5395	+0.1344	+90	+13

MARCH.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x′*	*y′*	N.	S.
48 Tauri	6	-0.14	- 9.1	+15 7.0	1 15 18.5	+ 9 48.4	+0.5885	0.5504	+0.1090	+77	+ 7
γ Tauri	4	0.11	9.1	15 21.0	17 11.2	+11 37.4	+0.5404	0.5525	0.1068	+72	+ 4
58 Tauri	6½	0.11	9.3	14 49.3	17 34.4	+11 59.8	+1.1490	0.5530	0.1059	+90	+47
63 Tauri	6	0.10	8.7	16 30.6	18 51.0	-10 46.1	-0.5285	0.5530	0.1041	+ 5	-58
δ⁴ Tauri	5½	-0.10	- 8.5	+17 10.8	19 9.1	-10 28.6	-1.2140	0.5533	+0.1038	-47	-73
70 Tauri	6½	0.08	9.0	15 40.7	19 54.5	- 9 44.7	+0.4733	0.5542	0.1029	+67	+ 1
71 Tauri	6	0.08	9.2	15 21.4	20 14.1	- 9 25.7	+0.8519	0.5542	0.1023	+90	+23
75 Tauri	6½	0.07	8.9	16 6.3	21 11.8	- 8 30.0	+0.1465	0.5550	0.1012	+44	-17
θ¹ Tauri	4	0.07	9.1	15 42.4	21 15.6	- 8 26.3	+0.5804	0.5552	0.1009	+76	+ 7
θ² Tauri	4	-0.07	- 9.1	+15 36.9	21 18.2	- 8 23.8	+0.6821	0.5552	+0.1009	+89	+13
80 Tauri	6½	0.06	9.2	15 23.1	21 59.4	- 7 44.0	+0.9963	0.5546	0.0996	+90	+33
B. A. C. 1391	5	0.06	9.0	15 56.6	22 10.4	- 7 33.3	+0.4171	0.5546	0.0993	+62	- 2
81 Tauri	6½	0.06	9.2	15 26.5	22 13.6	- 7 30.2	+0.9587	0.5550	0.0996	+90	+31
85 Tauri	6½	0.05	9.1	15 36.3	22 47.0	- 6 57.9	+0.8395	0.5552	0.0988	+90	+23
α Tauri	1	-0.03	- 8.9	+16 16.8	2 0 38.4	- 5 10.3	+0.2973	0.5559	+0.0960	+53	- 8
σ¹ Tauri	5	0.02	9.3	15 34.4	2 8.5	- 3 43.2	+1.1960	0.5575	0.0940	+90	+53
σ² Tauri	5	-0.02	9.2	15 41.4	2 11.4	- 3 40.4	+1.0750	0.5575	0.0938	+90	+40
B. A. C. 1526	5½	+0.07	8.9	16 58.4	10 23.6	+ 4 15.1	+0.4212	0.5616	0.0811	+62	0
π Tauri	5½	0.12	8.5	18 29.5	14 51.0	+ 8 33.3	-0.8429	0.5648	0.0741	-15	-72
111 Tauri	5½	+0.20	- 9.0	+17 16.4	22 24.8	- 8 8.7	+0.9596	0.5692	+0.0614	+90	+35
115 Tauri	6	0.21	8.8	17 51.8	23 37.4	- 6 58.7	+0.4113	0.5702	0.0594	+62	+ 2
117 Tauri	6½	0.22	9.1	17 8.5	3 0 0.8	- 6 36.0	+1.1930	0.5702	0.0588	+90	+56
119 Tauri	5	0.24	8.7	18 30.4	1 49.2	- 4 51.5	-1.4210	0.5709	0.0556	+27	-28
120 Tauri	6	0.24	8.7	18 27.4	2 23.6	- 4 18.3	-0.0579	0.5716	0.0546	+32	-23
127 Tauri	6½	+0.29	- 8.6	+18 55.3	6 29.5	- 0 21.0	-0.3375	0 5736	+0.0474	+16	-39
130 Tauri	6	0.31	9.1	17 41.0	8 26.8	+ 1 32.0	+1.0510	0.5744	0.0436	+90	+43
χ² Orionis	6	0.35	8.4	19 43.5	11 38.1	+ 4 36.3	-0.9581	0.5774	0.0378	-23	-70
χ³ Orionis	6	0.38	8.5	19 41.4	15 16.6	+ 8 6.9	-0.7930	0.5785	0.0309	-11	-70
68 Orionis	6	0.43	8.6	19 48.8	18 54.9	+11 37.3	-0.8183	0.5803	0.0239	-13	-70
71 Orionis	6	+0.44	-8.8	+19 11.5	20 7.8	-11 12.5	-0.1456	0.5813	+0.0215	+27	-25
ν Geminorum	4½	0.51	8.5	20 16.9	4 2 2.8	- 5 30.6	-1.1780	0.5833	+0.0098	-45	-70
f Geminorum	6	0.79	9.7	17 55.7	5 7 5.2	- 1 34.0	+0.6650	0.5948	-0.0498	+88	+18
g Geminorum	5½	0 82	9.5	18 46.9	9 45.9	+ 1 0.4	-0.3412	0.5956	0.0552	+16	-40
3 Cancri	6	0.86	9.7	17 36.8	15 41.8	+ 6 42.6	+0.4755	0.5961	0.0674	+67	+ 5
ζ¹ Cancri	4½	+0.90	- 9 7	+17 59.0	20 16.8	+11 6.9	-0.2278	0.5969	-0.0768	+22	-35
*d*² Cancri	6	0.95	9.9	17 24.9	6 1 46.0	- 7 36.7	-0.1104	0.5985	0.0878	+29	-29
54 Cancri	6½	1.01	10.2	15 45.9	11 52.3	+ 2 6.0	+0.5464	0.5993	0.1078	+73	+ 5
ο¹ Cancri	5½	1.03	10.2	15 45.2	14 21.1	+ 4 29.0	+0.2852	0.5994	0.1125	+52	-10
ο² Cancri	6	1.03	10.0	16 0.7	14 28.9	+ 4 36.4	+0.0133	0.5994	0.1128	+36	-24
π¹ Cancri	6½	+1.07	-10.2	+15 26.8	20 24.1	+10 17.8	-0.1256	0.5994	-0.1238	+28	-34
π² Cancri	6	+1.08	-10.1	+15 24.4	21 33.2	+11 24 2	-0.2298	0.5995	-0.1260	+22	-40

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0. Δα	Red'ns from 1887.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x'*	*y'*	N.	S.
		s	″	° ′	d h m	h m				°	°
7 Leonis	6½	+1.12	-10.1	+14 52.8	7 5 49.8	- 4 38.5	-0.8074	0.5985	-0.1400	-11	-75
ψ Leonis	6	1.14	10.1	14 32.0	8 58.8	- 1 36.9	-0.9160	0.5985	0.1452	-18	-76
18 Leonis	6	1.14	10.5	12 19.6	10 4.2	- 0 34.0	+1.1020	0.5985	0.1470	+90	+38
23 Leonis	6½	1.14	10.2	13 35.4	11 55.5	+ 1 13.0	-0.4187	0.5983	0.1497	+12	-55
ν Leonis	5½	1.15	10.4	12 58.8	14 49.0	+ 3 59.7	-0.2558	0.5975	0.1543	+21	-44
α Leonis	1½	+1.16	-10.3	+12 30.9	18 55.2	+ 7 56.3	-0.4451	0.5957	-0.1601	+10	-57
45 Leonis	6	1.19	10.3	10 20.1	8 2 42.4	- 8 34.5	+0.4052	0.5957	0.1706	+60	- 9
ρ Leonis	4	1.20	10.3	9 53.1	4 48.0	- 6 33.8	+0.4829	0.5956	0.1731	+66	- 5
49 Leonis	6	1.20	10.3	9 13.9	5 42.4	- 5 41.4	+0.9674	0.5956	0.1743	+90	+24
χ Leonis	4½	1.23	9.8	7 56.6	17 55.5	+ 6 4.0	+0.0147	0.5936	0.1873	+36	-32
σ Leonis	4	+1.23	- 9.6	+ 6 38.7	9 0 30.6	-11 36.4	+0.0326	0.5928	-0.1929	+37	-32
b Virginis	6	1.24	8.6	4 16.9	16 30.1	+ 3 46.9	-0.8210	0.5893	0.2016	-11	-86
10 Virginis	6½	1.24	8.3	+ 2 31.9	20 32.3	+ 7 40.0	+0.0700	0.5881	0.2028	+39	-31
γ Virginis *mult.*	2½	1.21	7.0	- 0 49.9	10 9 53.0	- 3 29.0	+0.6486	0.5864	0.2039	+82	+ 1
46 Virginis	6	1.18	6.1	2 45.7	17 46.7	+ 4 7.0	+0.9361	0.5847	0.2025	+87	+19
48 Virginis	6½	+1.18	- 6.0	- 3 3.4	19 10.0	+ 5 27.3	+0.9460	0.5843	-0.2019	+87	+19
65 Virginis	6	1.15	5,1	4 20.1	11 3 19.2	-10 41.6	+0.5698	0.5831	0.1991	+75	- 4
66 Virginis	6	1.15	5.1	4 34.5	3 49.7	-10 12.2	+0.7044	0.5831	0.1987	+84	+ 4
*l*² Virginis	5	1.14	4.7	5 40.4	6 57.6	- 7 11.2	+1.1690	0.5829	0.1970	+84	+37
80 Virginis	6	1.13	4.6	4 49.3	8 27.5	- 5 44.6	+0.0345	0.5820	0.1959	+36	-33
88 Virginis	6½	+1.11	- 3.9	- 6 16.5	13 50.7	- 0 33.3	+0.4257	0.5820	-0.1928	+59	-12
B. A. C. 4647	6½	1.10	3.5	7 30.2	16 39.7	+ 2 9.6	+1.1040	0.5817	0.1905	+83	+31
94 Virginis	6½	1.07	2.9	8 21.1	21 26.4	+ 6 45.8	+1.0450	0.5809	0.1864	+82	+27
ξ¹ Libræ	6	0.93	0.5	11 26.2	12 17 49.0	+ 2 23.8	+0.5428	0.5790	0.1650	+65	- 5
ξ² Libræ	5½	0.91	0.5	10 57.2	18 50.2	+ 3 22.8	-0.1108	0.5790	0.1640	+24	-41
17 Libræ	7	+0.91	- 0.5	-10 41.9	19 28.5	+ 3 59.7	-0.4716	0.5790	-0.1629	+ 5	-66
18 Libræ	6½	0.90	- 0.5	10 41.4	19 45.0	+ 4 15.7	-0.5252	0.5790	0.1627	+ 2	-70
B. A. C. 5070	6	0.80	+ 0.7	11 57.9	13 6 22.4	- 9 30.2	-0.8966	0.5781	0.1485	-21	-90
γ Libræ	4½	0.77	1.7	14 24.7	11 18.1	- 4 45.2	+0.8746	0.5777	0.1414	+76	+15
η Libræ	6	0.74	2.3	15 18.8	14 56.6	- 1 14.6	+1.2880	0.5774	0.1356	+75	+59
48 Libræ	5½	+0.65	+ 2.3	-13 57.2	21 0.2	+ 4 35.8	-0.8927	0.5774	-0.1265	-23	-90
W.² xvi., 140	6½	0.57	2.9	14 33.9	14 4 33.7	+11 52.9	-1.1800	0.5765	0.1140	-50	-90
φ Ophiuchi	4½	0.50	3.9	16 21.8	11 5.8	- 5 49.1	-0.0361	0.5751	0.1028	+23	-37
24 Scorpii	5½	0.45	4.3	17 31.2	15 33.8	- 1 30.7	+0.7201	0.5746	0.0952	+74	+ 6
29 Ophiuchi	6½	+0.35	5.1	18 43.0	15 0 17.9	+ 6 54.7	+1.2030	0.5729	0.0797	+71	+47
B. A. C. 6294	5½	-0.18	+ 5.6	-18 28.7	16 15 36.1	- 3 10.3	-0.7633	0.5646	-0.0078	-28	-90
Lalande 35497	6½	0.36	5.6	19 24.3	17 5 48.6	+10 33.0	+0.3012	0.5606	+0.0179	+34	-18
B. A. C. 6536	6	0.39	5.6	19 27.9	8 10.7	-11 9.7	+0.4129	0.5599	0.0221	+43	-11
d Sagittarii	5	0.44	5.4	19 9.1	12 27.3	- 7 1.8	+0.1871	0.5585	0.0295	+28	-24
ρ¹ Sagittarii	4	0.45	5.0	18 3.5	14 19.6	- 5 13.3	-0.9352	0.5585	0.0326	-36	-90
ρ² Sagittarii	6½	-0.45	+ 5.2	-18 30.9	14 23.4	- 5 9.7	-0.4396	0.5584	+0.0330	- 6	-64
B. A. C. 6707	6½	0.53	5.1	19 6.0	21 5.8	+ 1 19.3	+0.4530	0.5559	0.0442	+47	- 9
B. A. C. 6710	6	0.53	4.9	18 28.9	21 24.0	+ 1 36.8	-0.2043	0.5559	0.0450	+ 8	-48
57 Sextantis	6	0.61	4.8	19 19.7	18 4 25.5	+ 8 24.4	+1.0710	0.5526	0.0566	+71	+32
ρ Capricorni	5½	0.79	3.3	18 11.0	21 47.2	+ 1 12.1	+1.0420	0.5467	0.0830	+72	+29
B. A. C. 7263	6	-0.91	+ 1.9	-16 28.0	19 11 45.0	- 9 16.7	+0.4561	0.5417	+0.1024	+53	-10
Lalande 40522	6	0.91	1.5	14 55.2	12 17.4	- 8 45.4	-1.1891	0.5416	0.1029	-35	-90
29 Capricorni	5½	0.97	+ 1.0	15 38.5	20 39.3	- 0 39.1	+0.5111	0.5390	0.1140	+58	- 6
42 Capricorni	5½	1.05	- 0.3	14 33.0	20 9 33.8	+11 51.6	+0.8748	0.5337	0.1285	+75	+15
μ Capricorni	5	1.07	0.8	14 5.0	15 28.8	- 6 24.1	+1.1400	0.5323	0.1351	+76	+37
*c*² Aquarii	5½	-1.10	- 1.9	-12 7.2	21 0 22.1	+ 2 13.1	+0.2052	0.5298	+0.1436	+42	-24
σ Aquarii	5	1.14	2.9	11 15.4	10 42.6	-11 44.8	+0.7802	0.5266	0.1525	+79	+ 9
58 Aquarii	6½	1.14	3.0	11 29.1	11 14.8	-11 13.5	+1.1180	0.5266	0.1532	+79	+34
λ Aquarii	4	1.15	4.1	8 10.9	22 12.2	- 0 35.3	-0.8279	0.5238	0.1612	-14	-90
78 Aquarii	6½	1.15	4.3	7 48.4	23 13.9	+ 0 24.6	-1.0800	0.5234	0.1619	-32	-90
81 Aquarii	6½	-1.16	- 4.7	- 7 40.2	22 2 49.2	+ 3 53.7	-0.6464	0.5226	+0.1641	- 3	-82
82 Aquarii	6½	-1.16	- 4.8	- 7 11.0	3 25.7	+ 4 29.1	-1.0890	0.5225	+0.1644	-32	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	"	° ′	d h m	h m				°	°
h^1 Aquarii	5½	-1.17	- 4.8	- 8 18.3	22 4 47.6	+ 5 48.6	+0.3852	0.5223	+0.1652	+57	-14
ϕ Aquarii	4½	1.17	5.3	- 6 39.6	9 39.1	+10 31.7	-0.6352	0.5212	0.1680	- 2	-80
				NEW	*MOON.*						
μ Piscium	5	1.07	9.6	+ 5 33.4	25 10 9.3	+ 8 58.0	-1.3100	0.5212	0.1772	-56	-84
ν Piscium	4½	-1.06	- 9.9	+ 4 54.7	16 7.4	- 9 14.2	+0.4576	0.5229	+0.1753	+64	- 9
64 Ceti	5½	1.00	10.1	8 2.2	26 7 45.2	+ 5 56.4	-0.3107	0.5258	0.1679	+18	-52
ξ^1 Ceti	4½	0.99	10.1	8 18.8	8 35.9	+ 6 45.6	-0.4743	0.5261	0.1673	+ 9	-62
B. A. C. 755	6½	0.95	10.1	10 3.1	15 40.7	-10 22.1	-1.2205	0.5277	0.1631	-43	-80
ξ^2 Ceti	4½	0.96	10.3	7 57.0	16 25.6	- 9 38.6	+1.2170	0.5283	0.1625	+90	+45
B. A. C. 830	6	-0.91	-10.3	+10 15.3	23 43.2	- 2 34.0	-0.1538	0.5304	+0.1574	+26	-40
μ Ceti	4½	0.91	10.4	9 38.0	27 0 57.8	- 1 21.6	+0.7271	0.5313	0.1564	+90	+ 9
Lalande 5725	6	0.83	10.1	12 45.0	11 45.1	+ 9 6.0	-1.0540	0.5345	0.1471	-28	-77
f Tauri	4	0.76	10.3	12 32.7	23 53.4	- 3 8.0	+0.8855	0.5395	0.1351	+90	+21
48 Tauri	6	0.60	9.9	15 7.0	28 21 29.3	- 6 13.4	+0.7347	0.5496	0.1092	+90	+15
γ Tauri	4	-0.59	- 9.8	+15 21.0	23 23.0	- 4 23.4	+0.6847	0.5499	+0.1063	+90	+12
δ^1 Tauri	4	0.58	9.8	17 16.5	29 0 49.6	- 2 59.5	-1.2460	0.5510	0.1047	-51	-73
63 Tauri	6	0.57	9.6	16 30.5	1 4.2	- 2 45.4	-0.3910	0.5510	0.1045	+13	-49
δ^2 Tauri	5½	0.57	9.1	17 10.7	1 22.4	- 2 27.8	-1.0850	0.5514	0.1038	-32	-73
70 Tauri	6½	0.56	9.7	15 40.7	2 7.3	- 1 44.4	+0.6163	0.5518	0.1029	+80	+ 8
71 Tauri	6	-0.56	- 9.8	+15 21.4	2 28.1	- 1 24.3	+0.9984	0.5522	+0.1026	+90	+33
75 Tauri	6½	0.55	9.6	16 6.2	3 26.5	- 0 27.8	+0.2901	0.5526	0.1009	+52	- 9
θ^1 Tauri	4	0.55	9.7	15 42.4	3 30.4	- 0 24.0	+0.7263	0.5526	0.1009	+90	+15
θ^2 Tauri	4	0.55	9.7	15 36.9	3 33.1	- 0 21.4	+0.8308	0.5526	0.1009	+90	+22
80 Tauri	6½	0.55	9.8	15 23.1	4 14.9	+ 0 19.0	+1.1460	0.5526	0.0998	+90	+46
B. A. C. 1391	5	-0.54	- 9.6	+15 56.6	4 25.8	+ 0 29.6	+0.5630	0.5526	+0.0995	+75	+ 7
81 Tauri	6½	0.54	9.8	15 26.5	4 29.1	+ 0 32.8	+1.1100	0.5526	0.0993	+90	+43
85 Tauri	6½	0.54	9.7	15 36.3	5 3.1	+ 1 5.7	+0.9895	0.5529	0.0980	+90	+33
a Tauri	1	0.52	9.5	16 16.7	6 55.9	+ 2 54.8	+0.4434	0.5529	0.0961	+64	- 1
σ^2 Tauri	5	0.51	9.7	15 41.4	8 30.1	+ 4 25.8	+1.2280	0.5540	0.0937	+90	+57
B. A. C. 1526	5½	-0.44	- 9.4	+16 58.3	16 49.8	-11 31.1	+0.5761	0.5581	+0.0810	+76	+ 9
m Tauri	5½	0.39	8.9	18 29.5	21 21.9	- 7 6.3	-0.7036	0.5603	0.0738	- 5	-71
111 Tauri	5½	0.31	9.3	17 16.4	30 5 4.6	+ 0 18.7	+1.1210	0.5628	0.0611	+90	+48
115 Tauri	6	0.30	9.1	17 51.7	6 18.6	+ 1 30.1	+0.5666	0.5636	0.0592	+76	+11
119 Tauri	5	0.27	8.8	18 30.4	8 33.2	+ 3 40.0	+0.0071	0.5645	0.0555	+36	-20
120 Tauri	6	-0.27	- 8.9	+18 27.4	9 8.4	+ 4 14.1	+0.0940	0.5650	+0.0543	+41	-15
127 Tauri	6½	0.27	8.7	18 55.3	13 17.7	+ 8 14.7	-0.1912	0.5670	0.0473	+24	-31
130 Tauri	6	0.21	9.1	17 41.0	15 19.9	+10 12.7	+1.2140	0.5674	0.0433	+90	+60
χ^2 Orionis	6	0.17	8.4	19 43.5	18 35.6	-10 38.6	-0.8185	0.5690	0.0372	-13	-70
χ^3 Orionis	6	0.13	8.4	19 41.4	22 19.8	- 7 2.3	-0.6516	0.5706	0.0307	- 2	-62
χ^4 Orionis	5	-0.13	- 8.3	+20 8.3	22 31.4	- 6 51.1	-1.1200	0.5709	+0.0306	-37	-70
68 Orionis	6	0,08	8.3	19 48.8	31 2 4.0	- 3 25.9	-0.6784	0.5723	0.0237	- 4	-64
71 Orionis	6	0.07	8.6	19 11.5	3 18.9	- 2 13.7	+0.0053	0.5731	0.0214	+36	-17
ν Geminorum	4½	-0.01	- 8.1	+20 16.9	9 23.5	+ 3 37.8	-1.0470	0.5754	+0.0096	-30	-70
APRIL.											
f Geminorum	6	+0.34	- 8.7	+17 55.8	1 15 21.9	+ 8 30.6	+0.8160	0.5833	-0.0492	+90	+27
g Geminorum	5½	0.37	8.3	18 47.0	18 8.1	+11 10.4	-0.2093	0.5839	0.0547	+23	-30
3 Cancri	6	0.43	8.7	17 36.9	2 0 16.6	- 6 54.8	+0.6188	0.5853	0.0667	+81	+13
ζ^1 Cancri	4½	+0.49	- 8.5	+17 59.1	5 1.3	- 2 20.7	-0.1005	0.5856	-0.0762	+29	-28
d^1 Cancri	6	0.53	8.2	18 41.6	9 39.2	+ 2 6.8	-1.1960	0.5871	0.0851	-46	-71
d^2 Cancri	6	0.55	8.6	17 25.0	10 42.3	+ 3 7.5	+0.0153	0.5871	0.0868	+36	-22
54 Cancri	6½	0.67	8.9	15 46.0	21 9.9	-10 48.4	+0.6745	0.5875	0.1068	+88	+13
o^1 Cancri	5½	0.69	8.8	15 45.3	23 43.9	- 8 20.2	+0.4057	0.5875	0.1111	+61	- 4
o^2 Cancri	6	+0.70	- 8.7	+16 0.8	23 52.3	- 8 12.2	+0.1313	0.5875	-0.1114	+43	-18
π^2 Cancri	6	+0.77	- 8.9	+15 24.5	3 7 10.9	- 1 10.1	-0.1225	0.5883	-0.1246	+28	-33

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0. Δα	Red'ns from 1887.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
7 Leonis	6½	+0.85	- 8.9	+14 52.8	3 15 44.1	+ 7 3.8	-0.7161	0.5883	-0.1388	- 5	-75
ψ Leonis	6	0.88	9.0	14 32.0	18 59.2	+10 11.5	-0.8266	0.5883	0.1439	-12	-75
18 Leonis	6	0.89	9.5	12 19.6	20 6.7	+11 16.5	+1.2150	0.5884	0.1459	+90	+50
23 Leonis	6½	0.91	9.2	13 35.4	22 1.1	- 8 53.4	-0.3278	0.5880	0.1486	+17	-50
ν Leonis	5½	0.93	9.3	12 58.8	4 1 0.0	- 8 1.2	-0.1694	0.5878	0.1530	+26	-39
α Leonis	1½	+0.98	- 9.2	+12 30.9	5 13.3	- 3 57.5	-0.3632	0.5878	-0.1589	+15	-52
45 Leonis	6	1.06	9.4	10 20.1	13 13.4	+ 3 44.7	+0.4876	0.5878	0.1699	+67	- 5
ρ Leonis	4	1.07	9.4	9 53.1	15 22.2	+ 5 48.6	+0.5658	0.5875	0.1721	+74	- 1
49 Leonis	6	1.09	9.5	9 13.9	16 18.0	+ 6 42.3	+1.0510	0.5875	0.1734	+90	+30
χ Leonis	4½	1.18	9.1	7 56.6	5 4 47.2	- 5 16.5	+0.0690	0.5868	0.1867	+39	-29
σ Leonis	4	+1.23	- 9.0	+ 6 38.7	11 29.6	+ 1 10.9	+0.0770	0.5868	-0.1925	+39	-29
b Virginis	6	1.32	8.6	4 16.9	6 3 41.4	- 7 13.5	-0.8073	0.5864	0.2023	-10	-86
10 Virginis	6½	1.35	8.5	+ 2 31.9	7 45.3	- 3 18.7	+0.0817	0.5864	0.2037	+39	-30
γ Virginis *mult.*	2½	1.41	7.8	- 0 49.9	21 8.4	+ 9 34.6	+0.6296	0.5862	0.2056	+80	0
46 Virginis	6	1.44	7.2	2 45.7	7 5 0.9	- 6 50.5	+0.9067	0.5862	0.2049	+87	+16
48 Virginis	6½	+1.45	- 7.1	- 3 3.4	6 23.8	- 5 30.6	+0.9135	0.5862	-0.2046	+87	+16
65 Virginis	6	1.46	6.4	4 20.1	14 29.4	+ 2 16.9	+0.5196	0.5860	0.2015	+70	- 7
66 Virginis	6	1.47	6.3	4 34.5	14 59.7	+ 2 46.1	+0.6519	0.5860	0.2014	+82	+ 1
l^2 Virginis	5	1.48	6.1	5 40.4	18 5.5	+ 5 45.0	+1.1100	0.5865	0.2000	+84	+32
80 Virginis	6	1.47	5.9	4 49.3	19 34.5	+ 7 10.8	-0.0229	0.5865	0.1991	+33	-36
88 Virginis	6½	+1.48	- 5.4	- 6 16.5	8 0 53.5	-11 42.2	+0.3574	0.5865	-0.1959	+56	-16
B. A. C. 4647	6½	1.49	5.0	7 30.2	3 39.7	- 9 1.9	+1.0245	0.5865	0.1937	+82	+25
94 Virginis	6½	1.49	4.5	8 21.2	8 21.7	- 4 30.7	+0.9590	0.5865	0.1902	+82	+20
ξ^1 Libræ	6	1.46	2.2	11 26.2	9 4 17.6	- 9 19.4	+0.4238	0.5868	0.1688	+57	-12
ξ^2 Libræ	5½	1.45	2.2	10 57.2	5 17.1	- 8 22.1	-0.2222	0.5875	0.1677	+18	-48
17 Libræ	7	+1.45	- 2.2	-10 41.9	5 54.5	- 7 46.1	-0.5804	0.5875	-0.1670	- 1	-75
18 Libræ	6½	1.44	2.1	10 41.4	6 10.5	- 7 30.7	-0.6335	0.5875	0.1663	- 4	-81
B. A. C. 5070	6	1.41	- 0.5	11 57.9	16 30.2	+ 2 25.7	-1.0120	0.5875	0.1521	-30	-90
γ Libræ	4½	1.40	0.0	14 24.7	21 17.3	+ 7 2.1	+0.7275	0.5875	0.1450	+78	+ 6
η Libræ	6	1.38	+ 0.6	15 18.8	10 0 48.9	+10 25.8	+1.1320	0.5874	0.1394	+75	+36
48 Libræ	5½	+1.33	+ 0.9	-13 57.2	6 41.2	- 7 55.1	-1.0260	0.5866	-0.1296	-33	-90
49 Libræ	6	1.33	1.5	16 12.0	7 34.1	- 7 4.2	+1.1280	0.5865	0.1282	+74	+36
φ Ophiuchi	4½	1.23	2.6	16 21.9	20 19.4	+ 5 12.5	-0.1966	0.5855	0.1056	+14	-47
24 Scorpii	5½	1.20	3.1	17 31.2	11 0 38.5	+ 9 22.0	+0.5425	0.5848	0.0978	+59	- 5
29 Ophiuchi	6½	1.13	4.2	18 43.0	9 4.9	- 6 30.4	+1.0140	0.5839	0.0817	+71	+27
16 Sagittarii	6½	+0.76	+ 6.5	-20 25.1	12 16 6.9	- 0 36.7	+1.1940	0.5754	-0.0213	+70	+47
B. A. C. 6294	5½	0.66	6.1	18 28.7	23 9.9	+ 6 10.8	-0.9491	0.5733	-0.0078	-39	-90
29 Sagittarii	5½	0.55	6.9	20 27.0	13 7 4.5	-10 11.1	+1.1320	0.5692	+0.0074	+70	+39
Lalande 35497	6½	0.48	6.7	19 24.3	12 59.8	- 4 28.2	+0.1028	0.5678	0.0183	+23	-29
B. A. C. 6536	6	0.45	6.8	19 27.9	15 18.5	- 2 14.3	+0.2128	0.5659	0.0224	+29	-23
d Sagittarii	5	+0.39	+ 6.7	-19 9.1	19 29.1	+ 1 47.5	-0.0142	0.5646	+0.0299	+18	-36
ρ^1 Sagittarii	4	0.37	6.4	18 3.5	21 19.0	+ 3 33.7	-1.1250	0.5646	0.0330	-52	-90
ρ^2 Sagittarii	6½	0.37	6.5	18 30.9	21 22.9	+ 3 37.2	-0.6346	0.5641	0.0335	-18	-84
B. A. C. 6707	6½	0.28	6.7	19 6.0	14 3 56.6	+ 9 57.7	+0.2487	0.5610	0.0449	+33	-21
B. A. C. 6710	6	0.28	6.5	18 28.9	4 14.4	+10 14.8	-0.4008	0.5610	0.0452	- 3	-61
57 Sagittarii	6	+0.19	+ 6.7	-19 19.7	11 7.9	- 7 5.7	+0.8636	0.5575	+0.0570	+71	+16
π Capricorni	5	-0.02	6.0	18 34.8	15 3 29.5	+ 8 43.3	+1.2065	0.5494	0.0832	+71	+47
ρ Capricorni	5½	0.03	5.9	18 11.0	4 13.7	+ 9 26.1	+0.8367	0.5494	0.0838	+72	+14
B. A. C. 7263	6	0.18	4.5	16 27.9	18 2.8	- 1 11.4	+0.2641	0.5430	0.1035	+41	-20
29 Capriconri	5½	0.27	4.0	15 38.4	16 2 52.9	+ 7 22.0	+0.3254	0.5391	0.1147	+46	-17
42 Capricorni	5½	-0.39	+ 3.0	-14 33.0	15 43.4	- 4 11.3	+0.7010	0.5335	+0.1296	+77	+ 4
44 Capricorni	6	0.40	2.5	14 55.0	16 28.6	- 3 27.5	+1.2040	0.5329	0.1303	+75	+44
μ Capricorni	5	0.45	2.5	14 5.0	21 37.4	+ 1 31.9	+0.9725	0.5313	0.1358	+76	+22
e^2 Aquarii	5½	0.52	1.4	12 7.2	17 6 29.7	+10 8.2	+0.0497	0.5278	0.1446	+33	-32
σ Aquarii	5	0.60	0.5	11 15.4	16 50.3	- 3 49.6	+0.6347	0 5247	0.1534	+74	0
58 Aquarii	6½	-0.61	+ 0.5	-11 29.0	17 22.3	- 3 18.5	+0.9670	0.5248	+0.1537	+79	+21
λ Aquarii	4	-0.66	- 1.1	- 8 10.8	18 4 20.4	+ 7 20.4	-0.9594	0.5219	+0.1619	-23	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0. Δα	Red'ns from 1887.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
78 Aquarii	6½	-0.67	- 1.2	- 7 48.3	18 5 22.7	+ 8 20.8	-1.2050	0.5216	+0.1628	-44	-90
81 Aquarii	6½	0.69	1.5	7 40.1	8 58.1	+11 50.1	-0.7709	0.5207	0.1651	-10	-90
82 Aquarii	6½	0.69	1.7	7 10.9	9 34.6	-11 34.6	-1.2110	0.5204	0.1655	-44	-90
h^1 Aquarii	5½	0.71	1.6	8 18.2	10 56.7	-10 14.9	+0.2625	0.5200	0.1661	+49	-21
φ Aquarii	4½	0.73	2.3	6 39.5	15 48.7	- 5 31.3	-0.7501	0.5200	0.1692	- 8	-90
B. A. C. 8184	6½	-0.77	- 3.2	- 5 9.1	23 54.0	+ 2 20.2	-1.0420	0.5187	+0.1732	-27	-90
20 Piscium	5½	0.82	4.2	3 23.5	19 9 44.9	+11 54.4	-1.2690	0.5180	0.1772	-49	-90
24 Piscium	6½	0.83	4.3	3 47.1	12 25.0	- 9 30.1	-0.3593	0.5177	0.1782	+15	-57
27 Piscium	5	0.85	4.3	4 11.1	15 30.4	- 6 30.1	+0.6408	0.5172	0.1791	+81	0
29 Piscium	5	0.85	4.6	3 39.5	17 11.7	- 4 51.5	+0.3593	0.5172	0.1797	+57	-16
4 Ceti	6	-0.87	- 4.8	- 3 10.7	20 21.8	- 1 46.8	+0.3964	0.5172	+0.1804	+59	-14
5 Ceti	6	0.87	4.8	3 4.8	20 37.0	- 1 32.1	+0.3333	0.5172	0.1806	+55	-17
B. A. C. 5	5½	0.87	4.9	2 51.3	20 53.5	- 1 16.0	+0.1334	0.5172	0.1806	+43	-28
MERCURY				1 5.6	20 3 49.8	+ 5 28.5	-0.5629	0.4721	0.1661	+ 4	-73
10 Ceti	6	0.90	5.9	0 40.6	6 29.8	+ 8 3.9	-0.5445	0.5177	0.1824	+ 6	-71
14 Ceti	6	-0.92	- 6.1	- 1 7.7	11 17.0	-11 17.0	+0.8301	0.5177	+0.1825	+89	+12
15 Ceti	6½	0.93	6.3	- 1 7.7	12 39.1	- 9 57.3	+1.0800	0.5177	0.1826	+89	+29
				NEW	*MOON.*						
f Tauri	4	0.93	10.2	+12 32.7	24 5 42.0	+ 4 28.0	+1.0160	0.5424	0.1376	+90	+31
48 Tauri	6	-0.86	- 9.9	+15 7.0	25 3 9.0	+ 1 13.7	+0.8974	0.5516	+0.1113	+90	+25
γ Tauri	4	0.84	10.0	15 21.0	5 2.1	+ 3 3.0	+0.8523	0.5526	0.1085	+90	+23
δ^1 Tauri	4	0.85	9.7	17 16.5	6 28.0	+ 4 26.2	-1.0750	0.5537	0.1067	-31	-73
63 Tauri	6	0.85	9.8	16 30.5	6 42.5	+ 4 40.3	-0.2199	0.5539	0.1063	+23	-38
δ^2 Tauri	5½	0.84	9.7	17 10.7	7 0.7	+ 4 57.8	-0.9118	0.5539	0.1062	-18	-73
70 Tauri	6½	-0.84	- 9.9	+15 40.7	7 45.3	+ 5 40.9	+0.7877	0.5539	+0.1047	+90	+18
71 Tauri	6	0.84	10.0	15 21.4	8 6.0	+ 6 0.9	+1.1705	0.5539	0.1043	+90	+48
75 Tauri	6½	0.84	9.9	16 6.2	9 4.2	+ 6 57.2	+0.4641	0.5540	0.1030	+66	0
θ^1 Tauri	4	0.84	9.9	15 42.4	9 8.1	+ 7 1.0	+0.8993	0.5542	0.1029	+90	+26
θ^2 Tauri	4	0.84	9.9	15 36.9	9 10.6	+ 7 3.4	+1.0020	0.5542	0.1029	+90	+33
B. A. C. 1391	5	-0.83	- 9.9	+15 56.6	10 3.2	+ 7 54.3	+0.7374	0.5546	+0.1015	+90	+17
81 Tauri	6½	0.83	10.0	15 26.5	10 6.4	+ 7 57.4	+1.2880	0.5546	0.1015	+90	+68
85 Tauri	6½	0.83	9.9	15 36.3	10 40.0	+ 8 29.9	+1.1655	0.5551	0.1007	+90	+48
α Tauri	1	0.82	9.8	16 16.7	12 32.3	+10 18 6	+0.6230	0.5554	0.0977	+82	+ 9
B. A. C. 1526	5½	0.76	9.7	16 58.3	22 24.0	- 4 9.6	+0.7676	0.5594	0.0825	+90	+20
m Tauri	5½	-0.74	- 9.3	+18 29.4	26 2 55.2	+ 0 12.4	-0.5036	0.5610	+0.0753	+ 7	-54
115 Tauri	6	0.68	9.3	17 51.7	11 51.2	+ 8 50.1	+0.7722	0.5643	0.0604	+90	+22
119 Tauri	5	0.66	9.1	18 30.3	14 5.9	+11 0.1	+0.2189	0.5656	0.0565	+49	- 8
120 Tauri	6	0.66	9.0	18 27.3	14 41.0	+11 34.0	+0.3025	0.5657	0.0553	+54	- 4
127 Tauri	6½	0.62	8.9	18 55.3	18 50.7	- 8 24.9	+0.0195	0.5675	0.0482	+37	-18
χ^1 Orionis	4½	-0.59	- 8.3	+20 15.2	23 54.5	- 3 31.7	-1.1760	0.5693	+0.0389	-44	-70
χ^2 Orionis	6	0.59	8.5	19 43.5	27 0 9.5	- 3 17.3	-0.6029	0.5696	0.0384	+ 1	-58
χ^3 Orionis	6	0.55	8.4	19 41.4	3 54.2	+ 0 19.5	-0.4336	0.5702	0.0315	+11	-45
χ^4 Orionis	5	0.55	8.3	20 8.3	4 5.9	+ 0 30.8	-0.9038	0.5702	0.0313	-19	-70
68 Orionis	6	0.52	8.3	19 48.8	7 39.6	+ 3 57.0	-0.4594	0.5714	0.0246	+ 9	-46
71 Orionis	6	-0.52	- 8.5	+19 11.5	8 54.9	+ 5 9.6	+0.2297	0.5722	+0.0220	+49	- 4
16 Geminorum	6½	0.47	7.9	20 33.7	14 35.4	+10 38.1	-1.1260	0.5729	0.0112	-38	-69
ν Geminorum	4½	0.46	8.0	20 16.9	15 2.2	+11 3.8	-0.8239	0.5732	+0.0105	-13	-70
f Geminorum	6	0.14	8.0	17 55.8	28 21 24.0	- 7 40.0	+1.0640	0.5782	-0.0485	+90	+44
g Geminorum	5½	0.11	7.6	18 47.0	29 0 13.5	- 4 56.7	+0.0312	0.5784	0.0540	+38	-18
3 Cancri	6	-0.03	- 7.9	+17 36.9	6 29.4	+ 1 5.5	+0.8668	0.5790	-0.0661	+90	+28
ζ^1 Cancri	4½	+0.02	7.5	17 59.1	11 20.5	+ 5 46.0	+0.1399	0.5798	0.0753	+43	-14
d^1 Cancri	6	0.08	7.1	18 41.6	16 4.9	+10 19.9	-0.9707	0.5790	0.0843	-23	-71
d^2 Cancri	6	0.09	7.5	17 25.0	17 9.6	+11 22.4	+0.2564	0.5790	0.0862	+51	- 9
θ Cancri	5½	0.11	7.0	18 28.4	19 35.3	-10 17.2	-1.0480	0.5790	0.0904	-29	-72
54 Cancri	6½	+0.23	- 7.6	+15 46.0	30 3 54.2	- 2 16.6	+0.9210	0.5790	-0.1054	+90	+28
o^1 Cancri	5½	+0.27	- 7.5	+15 45.3	6 32.5	+ 0 16.0	+0.6495	0.5789	-0.1101	+85	+10

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

THE STAR'S					AT CONJUNCTION IN R. A.					LIMITING PARALLELS.	
Name.	Mag.	Red'ns from 1887.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
APRIL.											
o^2 Cancri	6	+0.27	-7.4	+16 0.8	**30** 6 40.9	+ 0 24.0	+0.3693	0.5789	-0.1103	+59	- 5
π^1 Cancri	6½	0.34	7.4	15 26.9	12 59.3	+ 6 28.6	+0.2164	0.5788	0.1210	+48	-15
π^2 Cancri	6	0.36	7.3	15 24.5	14 13.3	+ 7 39.9	+0.1056	0.5787	0.1231	+41	-21
7 Leonis	6½	+0.46	-7.2	+14 52.9	23 2.4	- 7 50.3	-0.5034	0·5775	-0.1370	+ 7	-59
MAY.											
ψ Leonis	6	+0.50	-7.1	+14 32.1	**1** 2 23.8	- 4 36.1	-0.6193	0.5772	-0.1421	+ 1	-69
23 Leonis	6½	0.54	7.3	13 35.5	5 31.8	- 1 35.0	-0.1115	0.5772	0.1467	+29	-35
ν Leonis	5½	0.58	7.3	12 58.9	8 37.0	+ 1 23.6	+0.0456	0.5772	0.1512	+38	-27
α Leonis	1½	+0.62	-7.3	+12 31.0	12 59.1	+ 5 36.1	-0.1602	0.5772	-0.1574	+26	-39
45 Leonis	6	0.73	7.6	10 20.2	21 16.0	-10 25.0	+0.6958	0.5771	0.1679	+89	+ 8
ρ Leonis	4	0.76	7.6	9 53.2	23 29.3	- 8 16.5	+0.7718	0.5767	0.1703	+90	+12
49 Leonis	6	0.78	7.8	9 14.0	**2** 0 27.1	- 7 20.7	+1.2650	0.5767	0.1715	+90	+52
χ Leonis	4½	0.93	7.6	7 56.7	13 23.0	+ 5 7.2	+0.2454	0.5759	0.1851	+50	-20
B. A. C. 3837	6½	+0.96	-7.2	+ 8 40.6	17 14.6	+ 8 50.5	-1.2065	0.5758	-0.1882	-41	-81
σ Leonis	4	1.01	7.7	6 38.8	20 19.5	+11 48.8	+0.2396	0.5755	0.1905	+50	-21
b Virginis	6	1.19	7.2	4 16.9	**3** 13 3.4	+ 3 56.5	-0.6871	0.5759	0.2009	- 2	-84
10 Virginis	6½	1.24	7.3	+ 2 31.9	17 15.0	+ 7 59.1	+0.2070	0.5765	0.2025	+47	-23
γ Virginis *mult.*	2½	1.38	6.9	- 0 49.9	**4** 7 0.9	- 2 44 8	+0.7293	0.5773	0.2049	+87	+ 5
46 Virginis	6	+1.45	-6.8	- 2 45.7	15 5.1	+ 5 1.9	+0.9886	0.5797	-0.2051	+87	+22
48 Virginis	6½	1.47	6.7	3 3.4	16 29.9	+ 6 23.6	+0.9917	0.5801	0.2047	+87	+22
65 Virginis	6	1.54	6.1	4 20.1	**5** 0 45.7	- 9 38.6	+0.5710	0.5808	0.2040	+73	- 4
66 Virginis	6	1.54	6.1	4 34.5	1 16.5	- 9 8.9	+0.7047	0.5811	0.2022	+85	+ 3
l^2 Virginis	5	1.57	6.0	5 40.4	4 25.8	- 6 6.6	+1.1590	0.5816	0.2007	+84	+36
80 Virginis	6	+1.57	-5.7	- 4 49.3	5 56.2	- 4 39.4	+0.0149	0.5817	-0.2000	+35	-35
88 Virginis	6½	1.62	5.2	6 16.5	11 20.2	+ 0 32.7	+0.3796	0.5824	0.1970	+57	-15
B. A. C. 4647	6½	1.65	5.1	7 30.2	14 9.0	+ 3 15.4	+1.0450	0.5825	0.1951	+83	+26
94 Virginis	6½	1.68	4.8	8 21.2	18 54.1	+ 7 49.9	+0.9654	0.5830	0.1914	+82	+20
ξ^1 Libræ	6	1.77	2.6	11 26.2	**6** 14 57.3	+ 3 8.5	+0.3764	0.5872	0.1713	+54	-15
ξ^2 Libræ	5½	+1.77	-2.5	-10 57.2	15 57.0	+ 4 5.9	-0.2736	0.5872	-0.1701	+17	-52
17 Libræ	7	1.77	2.5	10 41.9	16 34.4	+ 4 41.9	-0.6352	0.5872	0.1691	- 4	-81
18 Libræ	6½	1.77	2.4	10 41.4	16 50.4	+ 4 57.3	-0.6882	0.5872	0.1690	- 8	-88
B. A. C. 5070	6	1.80	1.2	11 57.9	**7** 3 8.8	- 9 7.5	-1.0910	0.5888	0.1550	-36	-90
γ Libræ	4½	1.82	0.6	14 24.7	7 54.1	- 4 32.9	+0.6333	0.5893	0.1478	+70	0
η Libræ	6	+1.83	-0.1	-15 18.8	11 24.1	- 1 10.8	+1.0300	0.5899	-0.1421	+75	+26
48 Libræ	5½	1.80	+0.5	13 57.2	17 13.2	+ 4 25.1	-1.1340	0.5913	0.1328	-42	-90
49 Libræ	6	1.82	0.8	16 12.0	18 5.4	+ 5 15.3	+1.0070	0.5912	0.1313	+74	+25
φ Ophiuchi	4½	1.80	2.1	16 21.9	**8** 6 40.0	- 6 38.7	-0.3351	0.5903	0.1087	+ 7	-56
24 Scorpii	5½	1.78	2.8	17 31.3	10 54.8	- 2 33.6	+0.3902	0.5903	0.1008	+49	-13
29 Ophiuchi	6½	+1.74	+3.9	-18 43.0	19 11.6	+ 5 24.3	+0.8387	0.5903	-0.0849	+71	+14
16 Sagittarii	6½	1.53	7.2	20 25.1	**10** 1 29.4	+10 33.9	+0.9638	0.5830	0.0230	+70	+23
21 Sagittarii	5	1.48	7.6	20 36.0	5 44.3	- 9 20.6	+1.0740	0.5820	0.0144	+69	+33
B. A. C. 6294	5½	1.44	7.3	18 28.7	8 21.1	- 6 49.6	-1.1650	0.5812	-0.0094	-57	-90
29 Sagittarii	5½	1.37	8.3	20 27.0	16 2.9	+ 0 35.2	+0.8849	0.5781	+0.0065	+70	+17
Lalande 35497	6½	+1.30	+8 4	-19 24.3	21 48.6	+ 6 8.5	-0.1436	0.5755	+0.0175	+ 9	-44
B. A. C. 6536	6	1.27	8.5	19 27.9	**11** 0 3.6	+ 8 18.7	-0.0368	0.5746	0.0219	+15	-38
d Sagittarii	5	1.21	8.6	19 9.1	4 7.5	-11 46.1	-0.2623	0.5731	0.0296	+ 4	-52
ρ^2 Sagittarii	6½	1.19	8.5	18 30.9	5 58.0	- 9 59.6	-0.8768	0.5716	0.0330	-32	-90
B. A. C. 6707	6½	1.12	8.9	19 6.0	12 20.8	- 3 50.3	-0.0106	0.5682	0.0447	+18	-36
B. A. C. 6710	6	+1.12	+8.8	-18 28.9	12 39.2	- 3 32.5	-0.6539	0.5679	+0.0451	-18	-87
f Sagittarii	5	1.08	9.3	20 1.7	16 45.1	+ 0 24.7	+1.1910	0.5663	0.0522	+70	+45
57 Sagittarii	6	1.04	9.2	19 19.6	19 21.8	+ 2 56.1	+0.5916	0.5649	0.0569	+59	- 2
π Capricorni	5	0.83	9.1	18 34.7	**12** 11 19.9	- 5 38.5	+0.9212	0.5559	0.0834	+71	+19
ρ Capricorni	5½	0.83	9.0	18 10.9	12 2.7	- 4 57.1	+0.5539	0.5552	0.0847	+58	- 4
B. A. C. 7263	6	+0.65	+8.4	-16 27.9	**13** 1 34.8	+ 8 8.3	-0.0144	0.5478	+0.1043	+24	-36
29 Capricorni	5½	+0.54	+8.0	-15 38.4	10 15.3	- 7 27.9	+0.0435	0.5429	+0.1156	+29	-33

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0. Δα	Red'ns from 1887.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
42 Capricorni	5½	+0.40	+7.2	−14 32.9	13 22 53.8	+ 4 46.7	+0.4154	0.5364	+0.1308	+54	−13
44 Capricorni	6	0.39	7.3	14 54.9	23 38.3	+ 5 29.8	+0.9145	0.5359	0.1315	+75	+18
μ Capricorni	5	0.34	6.8	14 4.9	14 4 43.1	+10 25.3	+0.6861	0.5332	0.1369	+75	+ 3
θ^2 Aquarii	5½	0.25	5.8	12 7.1	13 29.4	− 5 4.4	−0.2271	0.5298	0.1458	+18	−49
σ Aquarii	5	0.15	4.9	11 15.3	23 44.4	+ 4 52.2	+0.3615	0.5253	0.1544	+53	−15
58 Aquarii	6½	+0.14	+5.0	−11 28.9	15 0 16.4	+ 5 23.2	+0.6936	0.5250	+0.1549	+78	+ 3
λ Aquarii	4	+0.04	3.4	8 10.7	11 10.3	− 8 2.2	−1.2130	0.5220	0.1630	−45	−90
81 Aquarii	6½	−0.01	2.9	7 40.1	15 46.8	− 3 33.7	−1.0220	0.5204	0.1660	−27	−90
k^1 Aquarii	5½	0.03	3.0	8 18.2	17 45.0	− 1 38.9	+0.0092	0.5196	0.1672	+33	−35
ϕ Aquarii	4½	0.06	2.1	6 39.5	22 36.1	+ 3 3.8	−0.9926	0.5192	0.1703	−23	−90
χ Aquarii	5½	−0.08	+2.6	− 8 20.6	23 56.0	+ 4 21.4	+1.1000	0.5189	+0.1709	+82	+31
24 Piscium	6½	0.21	0.0	3 47.0	16 19 11.2	− 0 56.4	−0.5749	0.5163	0.1794	+ 4	−74
27 Piscium	5	0.24	−0.1	4 11.0	22 16.7	+ 2 3.9	+0.4252	0.5159	0.1803	+61	−12
29 Piscium	5	0.25	0.4	3 39.4	23 57.9	+ 3 42.3	+0.1460	0.5158	0.1808	+43	−27
4 Ceti	6	0.28	0.7	3 10.6	17 3 8.4	+ 6 47.3	+0.1867	0.5157	0.1816	+46	−25
5 Ceti	6	−0.28	−0.7	− 3 4.7	3 23.6	+ 7 2.1	+0.1257	0.5157	+0.1818	+42	−28
B. A. C. 5	5½	0.28	0.8	2 51.2	3 40.1	+ 7 18.1	−0.0739	0.5157	0.1818	+31	−40
10 Ceti	6	0.35	1.9	0 40.5	13 17.3	− 7 21.0	−0.7338	0.5157	0.1834	− 5	−90
14 Ceti	6	0.39	2.4	1 7.6	18 4.9	− 2 41.5	+0.6459	0.5154	0.1838	+81	0
15 Ceti	6½	0.39	2.3	− 1 7.6	19 27.1	− 1 21.7	+0.8987	0.5154	0.1838	+89	+15
29 Ceti	6½	−0.48	−3.8	+ 1 24.1	18 11 26.7	− 9 49.3	+1.0410	0.5176	+0.1832	+90	+25
33 Ceti	6	0.49	4.0	1 50.6	12 49.4	− 8 28.8	+0.8048	0.5178	0.1832	+90	+ 9
35 Ceti	6½	0.49	4.0	1 52.4	13 52.2	− 7 27.9	+0.9634	0.5183	0.1831	+90	+20
f Piscium	5	0.50	4.6	3 1.0	16 40.0	− 4 44.9	+0.2100	0.5194	0.1827	+48	−24
ν Piscium	4½	0.57	5.7	4 54.8	19 5 7.9	+ 7 21.3	+0.3761	0.5220	0.1793	+59	−14
64 Ceti	5½	−0.64	−6.8	+ 8 2.3	20 40.4	− 1 33.3	−0.3218	0.5267	+0.1724	+18	−53
ξ^1 Ceti	4½	0.64	7.0	8 18.9	21 30.7	− 0 44.6	−0.4808	0.5270	0.1721	+ 9	−64
B. A. C. 755	6½	0.66	7.4	10 3.2	20 4 32.0	+ 6 4.2	−1.1920	0.5297	0.1679	−39	−80
ξ^2 Ceti	4½	0.68	7.2	7 57.1	5 16.4	+ 6 47.2	+1.2350	0.5301	0.1675	+90	+46
B. A. C. 830	6	0.70	7.8	10 15.4	12 29.6	−10 12.6	−0.0966	0.5337	0.1624	+30	−38
μ Ceti	4½	−0.71	−7.8	+ 9 38.1	13 43.3	− 9 1.1	+0.7796	0.5341	+0.1615	+90	+11
				NEW	*MOON.*						
α Tauri	1	0.78	9.3	16 16.7	22 18 50.7	− 5 35.6	+0.7138	0.5601	0.1009	+90	+15
ω Tauri	5½	0.78	9.2	18 29.4	23 9 2.3	+ 8 7.0	−0.3826	0.5663	0.0783	+14	−45
115 Tauri	6	−0.75	−9.0	+17 51.7	16 51.0	− 8 22.8	+0.9078	0.5698	+0.0629	+90	+31
119 Tauri	5	0.75	8.9	18 30.4	20 3.7	− 5 14.6	+0.3557	0.5701	0.0593	+58	− 1
120 Tauri	6	0.75	9.0	18 27.4	20 38.5	− 4 41.0	+0.4442	0.5705	0.0579	+85	+ 4
127 Tauri	6½	0.73	8.7	18 55.3	24 0 44.6	− 0 43.5	+0.1717	0.5728	0.0505	+46	−10
χ^1 Orionis	4½	0.73	8.5	20 15.2	5 44.5	+ 4 5.7	−1.0090	0.5735	0.0411	−27	−70
χ^2 Orionis	6	−0.72	−8.6	+19 43.5	5 59.2	+ 4 19.8	−0.4393	0.5737	+0.0407	+11	−45
χ^3 Orionis	6	0.70	8.4	19 41.4	9 40.9	+ 7 53.6	−0.2663	0.5754	0.0336	+20	−33
χ^4 Orionis	5	0.71	8.4	20 8.3	9 52.5	+ 8 4.8	−0.7323	0.5754	0.0333	− 7	−70
68 Orionis	6	0.69	8.3	19 48.8	13 23.3	+11 28.1	−0.2834	0.5761	0.0262	+19	−35
71 Orionis	6	0.69	8.4	19 11.5	14 37.6	−11 20.3	+0.4043	0.5761	0.0241	+62	+ 5
16 Geminorum	6½	−0.67	−7.9	+20 33.7	20 13.8	− 5 56.1	−0.9335	0.5773	+0.0132	−21	−69
ν Geminorum	4½	0.67	8.0	20 17.1	20 40.3	− 5 30.6	−0.6369	0.5776	+0.0123	− 1	−60
ζ Geminor. *var*	4	0.58	7.3	20 44.0	25 11 40.5	+ 8 56.9	−1.1410	0.5799	−0.0175	−40	−69
61 Geminorum	6	0.51	6.8	20 28.8	21 22.7	− 5 42.2	−1.1380	0.5808	0.0370	−39	−70
g Geminorum	5½	0.42	6.9	18 47.0	26 5 33.2	+ 2 10.4	+0.2634	0.5805	0.0528	+52	− 5
3 Cancri	6	−0.36	−6.9	+17 36.9	11 47.4	+ 8 10.9	+1.1080	0.5804	−0.0652	+90	+46
ζ^1 Cancri	4½	0.32	6.6	17 59.1	16 37.9	−11 9.2	+0.3834	0.5799	0.0748	+60	− 1
d^1 Cancri	6	0.27	6.1	18 41.6	21 21.8	− 6 35.8	−0.7225	0.5793	0.0832	− 6	−71
d^2 Cancri	6	0.25	6.4	17 25.0	22 26.4	− 5 33.5	+0.5069	0.5793	0.0854	+70	+ 5
θ Cancri	5½	0.23	6.0	18 28.4	27 0 52.1	− 3 13.2	−0.7982	0.5793	0.0900	−11	−72
54 Cancri	6½	−0.13	−6.3	+15 46.0	9 12.1	+ 4 48.7	+1.1840	0.5780	−0.1050	+90	+51
o^1 Cancri	5½	−0.10	−6.2	+15 45.3	11 51.2	+ 7 22.2	+0.9107	0.5773	−0.1093	+90	+26

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0. Δα	Red'ns from 1887.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
o^2 Cancri	6	-0.10	- 6.1	+16 0.8	27 11 59.6	+ 7 30.2	+0.6295	0.5773	-0.1094	+82	+ 9
π^1 Cancri	6½	0.03	6.0	15 26.9	18 20.3	-10 23.0	+0.4794	0.5768	0.1200	+67	- 1
π^2 Cancri	6	-0.01	6.0	15 24.5	19 34.4	- 9 11.7	+0.3715	0.5767	0.1221	+59	- 7
7 Leonis	6½	+0.09	5.7	14 52.9	28 4 28.8	- 0 36.5	-0.2406	0.5746	0.1362	+22	-41
ψ Leonis	6	0.14	5.5	14 32.1	7 52.6	+ 2 40.0	-0.3567	0.5744	0.1414	+16	-50
23 Leonis	6½	+0.18	- 5.6	+13 35.5	11 3.1	+ 5 43.7	+0.1516	0.5733	-0.1459	+44	-21
ν Leonis	5½	0.21	5.7	12 58.9	14 10.9	+ 8 44.8	+0.3118	0.5731	0.1503	+55	-13
α Leonis	1½	0.26	5.6	12 31.0	18 37.1	-10 58.5	+0.1089	0.5723	0.1562	+42	-24
45 Leonis	6	0.40	5.8	10 20.2	29 3 3.0	- 2 50.6	+0.9661	0.5701	0.1662	+90	+27
ρ Leonis	4	0.42	5.9	9 53.2	5 19.0	- 0 39.4	+1.0440	0.5701	0.1690	+90	+29
χ Leonis	4½	+0.61	- 5.8	+ 7 56.7	19 31.6	-10 56.8	+0.5068	0.5680	-0.1832	+69	- 6
B. A. C. 3837	6½	0.65	5.3	8 40.6	23 29.2	- 7 7.5	-0.9663	0.5675	0.1865	-20	-81
σ Leonis	4	0.70	5.8	6 38.8	30 2 39.0	- 4 4.3	+0.4941	0.5675	0.1889	+67	- 7
b Virginis	6	0.94	5.2	4 16.9	19 52.1	-11 27.2	-0.4672	0.5670	0.1991	+10	-64
10 Virginis	6½	1.01	5.5	+ 2 31.9	31 0 11.6	- 7 16.8	+0.4329	0.5663	0.2003	+63	-12
γ Virginis *mult.*	2½	+1.19	- 5.5	- 0 49.9	14 24.0	+ 6 26.0	+0.9415	0.5674	-0.2033	+89	+18
46 Virginis	6	+1.31	- 5.3	- 2 45.7	22 44.1	- 9 31.4	+1.1880	0.5690	-0.2032	+87	+38

JUNE.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0. Δα	Red'ns from 1887.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
48 Virginis	6½	+1.33	- 5.4	- 3 3.4	1 0 11.6	- 8 7.0	+1.1860	0.5690	-0.2028	+87	+38
65 Virginis	6	1.43	4.9	4 20.1	8 43.4	+ 0 6.9	+0.7477	0.5701	0.1998	+86	+ 6
66 Virginis	6	1.44	4.9	4 34.5	9 15.3	+ 0 37.7	+0.8814	0.5703	0.1998	+86	+14
l^2 Virginis	5	1.48	4.9	5 40.4	12 30.6	+ 3 46.1	+1.3310	0.5712	0.1993	+84	+60
80 Virginis	6	1.49	4.4	4 49.3	14 4.0	+ 5 16.2	+0.1673	0.5715	0.1987	+44	-26
88 Virginis	6½	+1.57	- 4.2	- 6 16.5	19 38.1	+10 38.4	+0.5268	0.5728	-0.1960	+68	- 7
B. A. C. 4647	6¼	1.61	4.3	7 30.2	22 32.0	-10 33.8	+1.1940	0.5733	0.1942	+82	+39
94 Virginis	6½	1.66	4.0	8 21.2	2 3 25.6	- 5 50.7	+1.1040	0.5744	0.1909	+82	+31
ξ^1 Libræ	6	1.87	2.3	11 26.2	3 0 1.0	- 9 59.8	+0.4523	0.5795	0.1718	+59	-11
ξ^2 Libræ	5½	1.87	1.8	10 57.2	1 2.3	- 9 0.8	-0.2094	0.5797	0.1705	+20	-48
17 Libræ	7	+1.87	- 1.7	-10 41.9	1 40.5	- 8 23.9	-0.5729	0.5798	-0.1697	0	-75
18 Libræ	6½	1.87	1.7	10 41.4	1 56.8	- 8 8.3	-0.6265	0.5799	0.1693	- 3	-80
B. A. C. 5070	6	1.97	0.6	11 57.9	12 28.3	+ 2 0.0	-1.0600	0.5825	0.1559	-33	-90
γ Libræ	4½	2.03	- 0.2	14 24.7	17 19.0	+ 6 40.2	+0.6655	0.5838	0.1490	+73	+ 1
η Libræ	6	2.05	+ 0.1	15 18.8	20 52.6	+10 5.7	+1.0550	0.5855	0.1438	+75	+28
48 Libræ	5½	+2.07	+ 1.0	-13 57.2	4 2 46.8	- 8 13.3	-1.1370	0.5866	-0.1342	-41	-90
49 Libræ	6	2.10	0.9	16 12.0	3 39.7	- 7 22.4	+1.0140	0.5866	0.1328	+74	+26
φ Ophiuchi	4½	2.14	2.4	16 21.9	16 22.6	+ 4 51.9	-0.3672	0.5883	0.1107	+ 5	-59
24 Scorpii	5½	2.17	3.0	17 31.2	20 38.9	+ 8 58.7	+0.3491	0.5891	0.1029	+45	-16
29 Ophiuchi	6½	2.19	4.2	18 43.0	5 4 58.4	- 7 0.8	+0.7773	0.5898	0.0871	+71	+ 9
15 Sagittarii	6	+2.14	+ 8.0	-20 45.5	6 11 10.2	- 1 57.3	+1.1845	0.5865	-0.0251	+69	+45
16 Sagittarii	6½	2.14	8.0	20 25.1	11 10.8	- 1 56.7	+0.8328	0.5865	0.0251	+70	+14
21 Sagittarii	5	2.11	8.6	20 36.0	15 23.4	+ 2 6.1	+0.9358	0.5861	-0.0164	+69	+21
29 Sagittarii	5½	2.04	9.5	20 26.9	7 1 34.9	+11 55.4	+0.7183	0.5829	+0.0042	+68	+ 6
ξ^1 Sagittarii	5½	2.02	9.9	20 48.0	4 49.0	- 8 57.7	+1.1120	0.5816	0.0110	+69	+36
Lalande 35497	6½	+1.99	+ 9.8	-19 24.2	7 16.2	- 6 35.9	-0.3142	0.5809	+0.0157	- 1	-55
B. A. C 6536	6	1.97	10.0	19 27.8	9 29.0	- 4 27.9	-0.2129	0.5791	0.0204	+ 5	-49
d Sagittarii	5	1.95	10.4	19 9.0	13 29.3	- 0 36.4	-0.4466	0.5781	0.0282	- 7	-65
ρ^2 Sagittarii	6½	1.93	10.4	18 30.8	15 18.3	+ 1 8.6	-1.0620	0.5781	0.0316	-45	-90
B. A. C. 6707	6½	1.88	10.9	19 5.9	21 35.7	+ 7 12.6	-0.2091	0.5740	0.0438	+ 8	-48
B. A. C. 6710	6	+1.87	+10.9	-18 28.8	21 52.6	+ 7 28.8	-0.8472	0.5737	+0.0442	-28	-90
f Sagittarii	5	1.85	11.5	20 1.7	8 1 54.6	+11 22.3	+0.9806	0.5724	0.0518	+70	+24
57 Sagittarii	6	1.82	11.5	19 19.6	4 28.6	-10 9.2	+0.3764	0.5715	0.0561	+43	-14
π Capricorni	5	1.65	12.1	18 34.7	20 9.1	+ 4 58.6	+0.6833	0.5614	0.0830	+69	+ 3
ρ Capricorni	5½	1.64	12.0	18 10.9	20 51.5	+ 5 39.6	+0.3203	0.5609	0.0843	+41	-18
ο Capricorni	6	+1.64	+12.2	-18 57.1	21 18.8	+ 6 6.0	+1.1810	0.5607	+0.0845	+71	+43
υ Capricorni	5½	+1.58	+12.3	-18 32.0	9 1 57.3	+10 35.1	+1.1500	0.5582	+0.0925	+71	+39

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0.		Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
B. A. C. 7263	6	+1.49	+11.9	−16 27.8	**9** 10 7.9	− 5 30.7	−0.2653	0.5537	+0.1045	+11	−53
29 Capricorni	5½	1.40	11.7	15 38.3	18 38.7	+ 2 43.3	−0.2158	0.5484	0.1162	+15	−49
42 Capricorni	5½	1.25	11.3	14 32.8	**10** 7 4.1	− 9 15.2	+0.1429	0.5414	0.1314	+36	−27
44 Capricorni	6	1.24	11.4	14 54.8	7 47.9	− 8 32.8	+0.6377	0.5414	0.1322	+70	0
45 Capricorni	6½	1.23	11.5	15 15.8	8 15.4	− 8 6.2	+1.0800	0.5412	0.1328	+75	+30
μ Capricorni	5	+1.19	+11.1	−14 4.8	12 47.8	− 3 42.2	+0.4058	0.5374	+0.1377	+54	−13
e^2 Aquarii	5½	1.10	10.5	12 7.0	21 26.1	+ 4 40.0	−0.5036	0.5328	0.1464	+ 3	−69
σ Aquarii	5	1.00	9.7	11 15.2	**11** 7 33.0	− 9 31.6	+0.0766	0.5284	0.1553	+36	−31
58 Aquarii	6½	0.99	9.8	11 28.8	8 4.4	− 9 1.1	+0.4078	0.5284	0.1562	+56	−13
Lalande 44734	6½	0.87	9.2	10 39.4	18 54.3	+ 1 29.5	+1.2400	0.5241	0.1640	+79	+46
h^1 Aquarii	5½	+0.82	+ 8.2	− 8 18.1	**12** 1 22.1	+ 7 45.9	−0.2752	0.5219	+0.1683	+18	−52
χ Aquarii	5½	0.75	7.8	8 20.5	7 30.3	−10 16.7	+0.8126	0.5202	0.1717	+82	+10
24 Piscium	6½	0.59	5.4	3 46.9	**13** 2 39.8	+ 8 19.9	−0.8509	0.5159	0.1798	−13	−90
27 Piscium	5	0.55	5.1	4 10.9	5 45.0	+11 19.8	+0.1473	0.5151	0.1807	+44	−27
29 Piscium	5	0.54	4.9	3 39.3	7 25.9	−11 2.1	−0.1289	0.5146	0.1812	+28	−43
4 Ceti	6	+0.51	+ 4.6	− 3 10.5	10 36.2	− 7 57.2	−0.0847	0.5142	+0.1820	+31	−40
5 Ceti	6	0.51	4.5	3 4.6	10 51.3	− 7 42.5	−0.1473	0.5142	0.1820	+26	−44
B. A. C. 5	5½	0.51	4.5	2 51.1	11 7.8	− 7 26.5	−0.3450	0.5146	0.1823	+17	−56
10 Ceti	6	0.43	3.0	0 40.4	20 44.8	+ 1 54.2	−0.9963	0.5146	0.1840	−22	−90
14 Ceti	6	0.39	2.9	1 7.6	**14** 1 32.9	+ 6 34.3	+0.3893	0.5146	0.1845	+59	−14
15 Ceti	6½	+0.37	+ 2.9	− 1 7.6	2 55.1	+ 7 54.0	+0.6441	0.5146	+0.1845	+81	0
26 Ceti	6	0.25	1.3	+ 0 45.6	16 43.7	− 2 40.8	+1.1050	0.5153	0.1842	+90	+30
29 Ceti	6½	0.24	1.0	1 24.2	18 57.6	− 0 30.8	+0.8048	0.5157	0.1841	+90	+ 9
33 Ceti	6	0.23	0.8	1 50.7	20 20.3	+ 0 49.7	+0.5692	0.5159	0.1839	+74	− 5
35 Ceti	6½	0.22	0.7	1 52.5	21 23.4	+ 1 50.9	+0.7293	0.5160	0.1837	+90	+ 5
f Piscium	5	+0.20	+ 0.1	+ 3 1.1	**15** 0 12.1	+ 4 34.8	−0.0184	0.5160	+0.1831	+34	−36
ν Piscium	4½	0.11	− 1.2	4 54.9	12 43.4	− 7 15.4	+0.1651	0.5195	0.1800	+45	−25
64 Ceti	5½	0.00	3.0	8 2.3	**16** 4 20.3	+ 7 54.2	−0.5047	0.5244	0.1735	+ 8	−66
ξ^1 Ceti	4½	+0.01	3.1	8 18.9	5 11.0	+ 8 43.4	−0.6601	0.5248	0.1730	− 3	−79
ξ^2 Ceti	4½	−0.06	3.5	7 57.1	12 58.5	− 7 42.9	+1.0680	0.5283	0.1687	+90	+30
B. A. C. 830	6	−0.11	− 4.6	+10 15.4	20 13.4	− 0 41.0	−0.2473	0.5308	+0.1637	+21	−47
μ Ceti	4½	0.12	4.5	9 38.1	21 27.3	+ 0 30.7	+0.6310	0.5317	0.1626	+81	+ 3
Lalande 5725	6	0.18	5.7	12 45.1	**17** 8 8.1	+10 51.8	−1.0690	0.5370	0.1540	−32	−77
f Tauri	4	0.27	6.1	12 32.8	20 6.3	− 1 32.7	+0.9282	0.5433	0.1421	+90	+23
48 Tauri	6	0.39	7.2	15 7.1	**18** 17 17.3	− 5 2.7	+0.9018	0.5555	0.1164	+90	+25
γ Tauri	4	−0.38	− 7.4	+15 21.1	19 8.4	− 3 15.4	+0.8680	0.5572	+0.1139	+90	+23
δ^1 Tauri	4	0.40	7.8	17 16.6	20 33.0	− 1 53.5	−1.0380	0.5580	0.1121	−29	−73
63 Tauri	6	0.40	7.7	16 30.6	20 47.2	− 1 39.7	−0.1893	0.5580	0.1118	+25	−37
δ^2 Tauri	5½	0.40	7.8	17 10.8	21 5.2	− 1 22.4	−0.8718	0.5580	0.1111	−16	−73
70 Tauri	6½	0.41	7.6	15 40.8	21 49.1	− 0 40.0	+0.8128	0.5582	0.1102	+90	+20
71 Tauri	6	−0.42	− 7.5	+15 21.5	22 9.3	− 0 20.5	+1.1940	0.5585	+0.1094	+90	+51
75 Tauri	6½	0.42	7.7	16 6.3	23 6.3	+ 0 34.6	+0.5010	0.5591	0.1084	+70	+ 2
θ^1 Tauri	4	0.42	7.6	15 42.5	23 10.2	+ 0 38.4	+0.9324	0.5591	0.1084	+90	+28
θ^2 Tauri	4	0.42	7.6	15 37.0	23 12.3	+ 0 40.4	+1.0340	0.5594	0.1085	+90	+35
B. A. C. 1391	5	0.42	7.7	15 56.6	**19** 0 4.3	+ 1 30.6	+0.7754	0.5598	0.1070	+90	+18
85 Tauri	6½	−0.42	− 7.6	+15 36.4	0 38.7	+ 2 3.8	+1.1980	0.5605	+0.1063	+90	+52
a Tauri	1	0.42	7.7	16 16.8	2 30.7	+ 3 52.2	+0.6738	0.5618	0.1034	+90	+12
i Tauri	5½	0.46	7.9	18 38.7	9 26.4	+10 33.6	−1.1720	0.5656	0.0924	−44	−71
B. A. C. 1526	5½	0.48	7.9	16 58.4	12 9.9	−10 48.4	+0.8547	0.5665	0.0881	+90	+25
m Tauri	5½	0.49	8.0	18 29.5	16 35.0	− 6 32.6	−0.3852	0.5680	+0.0805	+14	−45
				NEW	*MOON.*						
ζ Geminor. *var.*	4	−0.55	− 7.0	+20 44.0	**21** 18 26.2	− 6 29.9	−1.0360	0.5860	−0.0156	−29	−69
56 Geminorum	5½	0.53	6.7	20 39.3	**22** 1 52.2	+ 0 39.5	−1.1280	0.5878	0.0312	−38	−69
g Geminorum	5½	0.49	6.4	18 47.0	11 57.3	+10 21.9	+0.3890	0.5880	0.0520	+61	+ 2
3 Cancri	6	−0.45	− 6.3	+17 36.9	18 3.9	− 7 45.2	+1.2370	0.5879	−0.0644	+90	+61
ζ^1 Cancri	4½	−0.42	− 6.2	+17 59.1	22 48.4	− 3 11.3	+0.5283	0.5874	−0.0738	+73	+ 7

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0. Δα	Red'ns from 1887.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
JUNE.											
d^1 Cancri	6	-0.39	- 5.6	+18 41.6	23 3 26.8	+ 1 16.7	-0.5650	0.5865	-0.0828	+ 3	-59
d^2 Cancri	6	0.38	5.8	17 25.0	4 30.2	+ 2 17.7	+0.6592	0.5865	0.0847	+88	+14
θ Cancri	5½	0.37	5.5	18 28.4	6 53.0	+ 4 35.2	-0.6325	0.5855	0.0894	- 1	-65
o^1 Cancri	5½	0.29	5.3	15 45.3	17 39.8	- 9 1.9	+1.0800	0.5844	0.1092	+90	+39
o^2 Cancri	6	0.29	5.3	16 0.8	17 47.7	- 8 54.4	+0.8004	0.5844	0.1095	+90	+20
π^1 Cancri	6½	-0.23	- 5.0	+15 26.9	24 0 2.1	- 2 53.9	+0.6610	0.5830	-0.1205	+86	+10
π^2 Cancri	6	0.22	5.0	15 24.5	1 15.1	- 1 43.5	+0.5525	0.5820	0.1221	+74	+ 3
7 Leonis	6½	0.15	4.7	14 52.9	10 1.4	+ 6 43.5	-0.0441	0.5794	0.1364	+33	-30
ψ Leonis	6	0.11	4.6	14 32.1	13 22.2	+ 9 57.0	-0.1562	0.5786	0.1415	+27	-37
23 Leonis	6½	0.07	4.6	13 35.5	16 30.2	-11 1.9	+0.3548	0.5782	0.1460	+59	-10
ν Leonis	5½	-0.04	- 4.5	+12 58.9	18 35.6	- 8 3.1	+0.5170	0.5768	-0.1502	+70	- 2
α Leonis	1½	0.00	4.3	12 31.0	23 58.9	- 3 49.4	+0.3170	0.5758	0.1564	+56	-13
45 Leonis	6	+0.13	4.4	10 20.2	25 8 20.1	+ 4 15.9	+1.1810	0.5731	0.1667	+90	+43
ρ Leonis	4	0.14	4.3	9 53.2	10 35.2	+ 6 26.2	+1.2610	0.5724	0.1692	+90	+52
l Leonis	5½	0.21	3.5	11 8.5	17 45.9	-10 38.3	-1.2550	0.5703	0.1765	-47	-79
χ Leonis	4½	+0.32	- 4.1	+ 7 56.7	26 0 44.2	- 3 56.8	+0.7313	0.5688	-0.1829	+90	+ 8
B. A. C. 3837	6½	0.36	3.6	8 40.6	4 41.6	- 0 7.8	-0.7432	0.5682	0.1862	- 8	-81
σ Leonis	4	0.41	4.0	6 38.8	7 51.4	+ 2 55.4	+0.7230	0.5674	0.1888	+90	+ 6
b Virginis	6	0.65	3.5	4 16.9	27 1 9.5	- 4 22.5	-0.2412	0.5644	0.1984	+22	-50
10 Virginis	6½	0.72	3.8	+ 2 31.9	5 31.0	- 0 10.0	+0.6627	0.5636	0.1999	+84	+ 1
γ Virginis *mult.*	2½	+0.92	- 3.7	- 0 49.9	19 54.1	-10 16.5	+1.1680	0.5630	-0.2022	+89	+36
65 Virginis	6	1.20	3.1	4 20.1	28 14 33.6	+ 7 44.5	+0.9594	0.5641	0.1996	+86	+20
66 Virginis	6	1.21	3.2	4 34.5	15 6.3	+ 8 16.1	+1.0930	0.5644	0.1995	+85	+30
80 Virginis	6	1.27	2.8	4 49.2	20 1.2	-10 59.2	+0.3665	0.5649	0.1974	+57	-16
88 Virginis	6½	1.35	2.7	6 16.4	29 1 42.9	- 5 29.6	+0.7213	0.5650	0.1946	+84	+ 4
94 Virginis	6½	+1.48	- 2.5	- 8 21.1	9 41.8	+ 2 13.0	+1.2940	0.5661	-0.1896	+82	+53
ξ^1 Libræ	6	1.77	1.2	11 26.2	30 6 49.8	- 1 23.4	+0.6067	0.5711	0.1707	+71	- 1
ξ^2 Libræ	5½	1.77	0.9	10 57.2	7 52.6	- 0 22.9	-0.0644	0.5714	0.1696	+28	-40
17 Libræ	7	1.77	0.9	10 41.9	8 31.9	+ 0 15.0	-0.4322	0.5714	0.1689	+ 8	-64
18 Libræ	6½	1.78	- 0.8	10 41.4	8 48.7	+ 0 31.2	-0.4881	0.5715	0.1685	+ 5	-67
B. A. C. 5070	6	+1.91	+ 0.2	-11 57.9	19 37.3	+10 56.6	-0.9439	0.5744	-0.1555	-25	-90
JULY.											
γ Libræ	4½	+2.00	+ 0.3	-14 24.7	1 0 35.9	- 8 15.5	+0.9685	0.5760	-0.1488	+76	+ 9
η Libræ	6	+2.05	+ 0.5	-15 18.8	4 15.3	- 4 44.0	+1.1800	0.5760	-0.1434	+75	+39
48 Libræ	5½	2.09	1.5	13 57.2	10 18.5	+ 1 6.0	-1.0500	0.5786	0.1346	-34	-90
49 Libræ	6	2.13	1.3	16 12.0	11 12.6	+ 1 58.2	+1.1260	0.5786	0.1328	+74	+35
ϕ Ophiuchi	4½	2.24	2.9	16 21.9	2 0 14.3	- 9 28.6	-0.2975	0.5812	0.1114	+ 9	-54
24 Scorpii	5½	2.28	3.4	17 31.2	4 36.7	- 5 15.9	+0.4177	0.5824	0.1036	+50	-12
29 Ophiuchi	6½	+2.36	+ 4.4	-18 43.0	13 6.5	+ 2 55.2	+0.8350	0.5843	-0.0881	+71	+13
15 Sagittarii	6	2.48	8.4	20 45.5	3 19 46.8	+ 8 27.2	+1.1820	0.5843	0.0270	+69	+44
16 Sagittarii	6½	2.48	8.4	20 25.1	19 47.3	+ 8 27.7	+0.8264	0.5843	0.0270	+70	+13
21 Sagittarii	5	2.49	9.0	20 35.9	4 0 2.5	-11 26.5	+0.9200	0.5835	-0.0182	+69	+20
29 Sagittarii	5½	2.48	10.3	20 26.9	10 19.0	- 1 32.7	+0.6858	0.5812	+0.0026	+64	+ 4
ξ^1 Sagittarii	5½	+2.48	+10.8	-20 48.0	13 34.2	+ 1 35.4	+1.0730	0.5805	+0.0089	+69	+32
Lalande 35497	6½	2.46	11.1	19 24.2	16 2.0	+ 3 57.8	-0.3609	0.5801	0.0142	- 4	-59
B. A. C. 6536	6	2.46	11.3	19 27.8	18 15.6	+ 6 6.6	-0.2626	0.5790	0.0186	+ 3	-52
d Sagittarii	5	2.43	11.6	19 9.0	22 16.6	+ 9 58.9	-0.5035	0.5778	0.0265	-10	-70
ρ^2 Sagittarii	6½	2.42	11.7	18 30.8	5 0 5.7	+11 43.9	-1.1210	0.5765	0.0301	-51	-90
B. A. C. 6707	6½	+2.41	+12.4	-19 5.9	6 23.4	- 6 11.8	-0.2800	0.5746	+0.0423	+ 4	-53
B. A. C. 6710	6	2.40	12.4	18 28.8	6 40.4	- 5 55.4	-0.9228	0.5746	0.0427	-33	-90
f Sagittarii	5	2.40	12.9	20 1.7	10 42.3	- 2 2.2	+0.9014	0.5729	0.0499	+70	+18
57 Sagittarii	6	2.38	13.0	19 19.6	13 16.1	+ 0 26.2	+0.2951	0.5724	0.0550	+37	-19
σ Capricorni	5½	2.32	14.0	19 28.0	6 1 18.7	+11 54.4	+1.2380	0.5658	0.0767	+71	+52
π Capricorni	5	+2.29	+14.1	-18 34.7	4 53.2	- 8 29.5	+0.5748	0.5645	+0.0822	+60	- 3
ρ Capricorni	5½	+2.28	+14.1	-18 10.9	5 35.3	- 7 48.7	+0.2099	0.5636	+0.0830	+35	-24

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
ο Capricorni	6	+2.29	+14.2	−18 57.1	6 6 2.5	− 7 22.4	+1.0690	0.5635	+0.0840	+71	+31
υ Capricorni	5½	2.24	14.5	18 32.0	10 39.3	− 2 55.1	+1.0280	0.5607	0.0913	+71	+27
B. A. C. 7263	6	2.17	14.7	16 27.8	18 46.3	+ 4 55.5	−0.3937	0.5565	0.1038	+ 4	−61
29 Capriconri	5½	2.10	14.8	15 38.3	7 3 12.9	−10 54.7	−0.3562	0.5533	0.1157	+ 7	−58
42 Capricorni	5½	2.01	14.8	14 32.8	15 31.0	+ 0 59.5	−0.0144	0.5453	0.1312	+27	−36
44 Capricorni	6	+2.00	+14.9	−14 54.8	16 14.4	+ 1 41.6	+0.4783	0.5448	+0.1319	+58	− 9
45 Capricorni	6½	2.00	15.0	15 15.8	16 41.5	+ 2 7.9	+0.9168	0.5448	0.1325	+75	+18
μ Capricorni	5	1.96	14.9	14 4.8	21 11.2	+ 6 29.0	+0.2423	0.5420	0.1376	+43	−22
ϵ^{2} Aquarii	5½	1.88	14.5	12 7.0	8 5 44.3	− 9 14.0	−0.6770	0.5373	0.1467	− 7	−87
42 Aquarii	6	1.86	14.7	13 23.4	8 47.4	− 6 16.5	+1.1630	0.5362	0.1495	+77	+37
σ Aquarii	5	+1.79	+14.2	−11 15.2	15 44.8	+ 0 28.0	−0.1057	0.5326	+0.1558	+25	−42
58 Aquarii	6½	1.78	14.2	11 28.8	16 16.0	+ 0 58.3	+0.2222	0.5323	0.1562	+44	−23
70 Aquarii	6	1.71	14.9	11 9.0	9 0 48.8	+ 9 15.7	+1.2280	0.5292	0.1631	+79	+44
Lalande 44734	6½	1.69	13.8	10 39.4	2 58.5	+11 21.5	+1.0420	0.5276	0.1645	+79	+26
h^{1} Aquarii	5½	1.63	13.0	8 18.0	9 24.0	− 6 24.4	−0.4755	0.5249	0.1688	+ 7	−66
χ Aquarii	5½	+1.57	+12.9	− 8 20.4	15 29.3	− 0 29.8	+0.6092	0.5228	+0.1723	+74	− 2
24 Piscium	6½	1.40	10.6	3 46.8	10 10 31.8	− 6 0.3	−1.0570	0.5178	0.1803	−27	−90
27 Piscium	5	1.39	10.5	4 10.8	13 36.0	− 3 1.4	−0.0626	0.5170	0.1812	+31	−40
29 Piscium	5	1.38	10.3	3 39.2	15 16.7	− 1 23.6	−0.3389	0.5165	0.1816	+17	−56
4 Ceti	6	1.35	9.9	3 10.4	18 26.4	+ 1 40.8	−0.2947	0.5156	0.1824	+18	−53
5 Ceti	6	+1.35	+ 9.9	− 3 4.5	18 41.4	+ 1 55.3	−0.3574	0.5156	+0.1824	+16	−57
B. A. C. 5	5½	1.35	9.7	2 51.0	18 58.0	+ 2 11.4	−0.5563	0.5156	0.1824	+ 5	−72
10 Ceti	6	1.28	8.4	0 40.4	11 4 33.8	+11 30.9	−1.2050	0.5146	0.1842	−40	−90
14 Ceti	6	1.23	8.3	1 7.5	9 21.3	− 7 49.6	+0.1771	0.5142	0.1845	+46	−26
15 Ceti	6½	1.21	8.2	− 1 7.5	10 44.1	− 6 29.2	+0.4336	0.5142	0.1847	+63	−12
26 Ceti	6	+1.09	+ 6.8	+ 0 45.7	12 0 34.1	+ 6 57.4	+0.8987	0.5142	+0.1842	+90	+16
29 Ceti	6½	1.07	6.5	1 24.3	2 48.6	+ 9 8.0	+0.5967	0.5140	0.1837	+76	− 3
33 Ceti	6	1.07	6.2	1 50.8	4 11.8	+10 28.9	+0.3628	0.5140	0.1834	+58	−16
35 Ceti	6½	1.06	6.2	1 52.6	5 15.2	+11 30.5	+0.5249	0.5140	0.1834	+70	− 7
f Piscium	5	1.02	5.5	3 1.2	8 4.3	− 9 45.3	−0.2228	0.5146	0.1829	+23	−48
ν Piscium	4½	+0.93	+ 3.9	+ 4 55.0	20 40.0	+ 2 29.0	−0.0312	0.5170	+0.1797	+34	−36
64 Ceti	5½	0.82	1.6	8 2.4	13 12 24.8	− 6 13.5	−0.6905	0.5210	0.1729	− 3	−81
ξ^{1} Ceti	4½	0.82	1.6	8 19.0	13 15.9	− 5 23.8	−0.8463	0.5211	0.1726	−12	−82
ξ^{2} Ceti	4½	0.73	+ 1.3	7 57.2	21 7.9	+ 2 14.2	+0.8941	0.5241	0.1683	+90	+18
B. A. C. 830	6	0.68	− 0.1	10 15.5	14 4 27.2	+ 9 20.5	−0.4198	0.5277	0.1633	+12	−58
μ Ceti	4½	+0.66	0.0	+ 9 38.2	5 42.0	+10 13.2	+0.4627	0.5277	+0.1624	+65	− 8
Lalande 5725	6	0.58	1.7	12 45.2	16 29.6	− 2 58.9	−1.2280	0.5328	0.1537	−45	−77
f Tauri	4	0.47	2.5	12 32.9	15 4 35.2	+ 8 44.3	+0.7870	0.5388	0.1422	+90	+14
48 Tauri	6	0.29	4.4	15 7.1	16 1 58.0	+ 5 25.9	+0.8000	0.5526	0.1181	+90	+18
γ Tauri	4	0.27	4.5	15 21.1	3 49.9	+ 7 14.1	+0.7554	0.5546	0.1145	+90	+16
δ^{1} Tauri	4	+0.26	− 5.1	+17 16.6	5 15.2	+ 8 36.5	−1.1450	0.5546	+0.1125	−38	−73
63 Tauri	6	0.25	5.0	16 30.6	5 29.5	+ 8 50.4	−0.2982	0.5546	0.1123	+18	−43
δ^{2} Tauri	5½	0.26	5.1	17 10.8	5 47.7	+ 9 8.0	−0.9804	0.5546	0.1118	−23	−73
70 Tauri	6½	0.24	4.8	15 40.8	6 31.7	+ 9 50.5	+0.7070	0.5556	0.1109	+90	+13
71 Tauri	6	0.23	4.8	15 21.5	6 52.2	+10 10.4	+1.0890	0.5556	0.1104	+90	+40
75 Tauri	6½	+0.23	− 5.0	+16 6.3	7 49.7	+11 5.9	+0.3958	0.5556	+0.1089	+61	− 4
θ^{1} Tauri	4	0.23	4.9	15 42.5	7 53.4	+11 9.5	+0.8271	0.5556	0.1089	+90	+21
θ^{2} Tauri	4	0.23	4.9	15 37.0	7 56.0	+11 12.0	+0.9288	0.5559	0.1087	+90	+28
80 Tauri	6½	0.22	4.9	15 23.2	8 37.2	+11 51.9	+1.2470	0.5565	0.1079	+90	+58
B. A. C. 1391	5	0.22	5.0	15 56.7	8 48.0	−11 57.7	+0.6702	0.5567	0.1075	+88	+11
81 Tauri	6½	+0.22	− 4.9	+15 26.6	8 51.1	−11 54.7	+1.2120	0.5567	+0.1075	+90	+53
85 Tauri	6½	0.21	5.0	15 36.4	9 24.4	−11 22.5	+1.0980	0.5576	0.1067	+90	+41
α Tauri	1	0.22	5.3	16 16.8	11 15.3	− 9 35.3	+0.5712	0.5576	0.1041	+76	+ 6
i Tauri	5½	0.15	6.1	18 38.7	18 13.3	− 2 51.6	−1.2610	0.5619	0.0935	−56	−71
B. A. C. 1526	5½	0.11	5.9	16 58.4	20 57.4	− 0 13.0	+0.7663	0.5635	0.0891	+90	+19
m Tauri	5½	+0.09	− 6.3	+18 29.5	17 1 23.3	+ 4 3.6	−0.4666	0.5669	+0.0817	+ 9	−51
115 Tauri	6	+0.02	− 6.5	+17 51.8	10 7.0	−11 31.1	+0.8455	0.5716	+0.0668	+90	+27

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0. Δα	Red'ns from 1887.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
119 Tauri	5	+0.01	− 6.6	+18 30.4	17 12 18.1	− 9 24.6	+0.3088	0.5724	+0.0628	+55	− 4
120 Tauri	6	+0.01	6.6	18 27.4	12 52.5	− 8 51.4	+0.3966	0.5731	0.0617	+61	+ 1
127 Tauri	6½	−0.03	6.8	18 55.3	16 55.1	− 4 57.5	+0.1418	0.5755	0.0543	+44	−12
χ^1 Orionis	4½	0.06	6.9	20 15.2	21 50.1	− 0 13.2	−1.0120	0.5785	0.0449	−27	−70
χ^2 Orionis	6	0.06	6.8	19 43.5	22 4.4	+ 0 0.6	−0.4475	0.5788	0.0446	+10	−47
χ^3 Orionis	6	−0.08	− 6.9	+19 41.4	18 1 42.1	+ 3 30.4	−0.2595	0 5798	+0.0374	+21	−33
χ^4 Orionis	5	0.08	7.0	20 8.3	1 53.4	+ 3 41.4	−0.7213	0.5801	0.0371	− 6	−70
68 Orionis	6	0.11	6.9	19 48.8	5 19.9	+ 7 0.3	−0.2661	0.5815	0.0303	+20	−33
71 Orionis	6	0.11	6.9	19 11.5	6 32.6	+ 8 10.3	+0.4192	0.5825	0.0276	+63	+ 5
16 Geminorum	6½	0.15	7.0	20 33.7	12 1.0	−10 33.4	−0.8839	0.5845	0.0168	−17	−69
ν Geminorum	4½	−0.15	− 7.0	+20 16.9	12 26.9	−10 8.5	−0.5876	0.5848	+0.0160	+ 2	−55
ζ Geminor. *var.*	4	0.23	6.9	20 44.0	19 3 1.9	+ 3 53.7	−1.0400	0.5902	−0.0144	−29	−69
				NEW	*MOON.*						
ψ Leonis	6	0.18	3.9	14 32.1	21 20 36.4	− 5 1.2	−0.0753	0.5856	0.1420	+31	−33
23 Leonis	6½	−0.16	− 3.8	+13 35.5	23 39.6	− 2 4.7	+0.4319	0.5852	−0.1465	+63	− 6
ν Leonis	5½	0.13	3.7	12 58.9	22 2 40.2	+ 0 49.1	+0.5964	0.5845	0.1513	+77	+ 4
a Leonis	1½	0.11	3.5	12 31.0	6 56.5	+ 4 55.8	+0.4037	0.5840	0.1575	+61	− 8
34 Leonis	6½	0.10	3.2	13 54.6	8 17.3	+ 6 13.6	−1.2100	0.5838	0.1591	−43	−76
45 Leonis	6	−0.02	3.4	10 20.2	15 4.9	−11 14.8	+1.2665	0.5811	0.1680	+90	+53
l Leonis	5½	+0.03	− 2.7	+11 8.6	23 0 16.2	− 2 22.5	−1.1360	0.5789	−0.1783	−34	−79
χ Leonis	4½	0.11	2.7	7 56.8	7 4.3	+ 4 10.8	+0.8362	0.5767	0.1849	+90	+14
B. A. C. 3837	6½	0.14	2.3	8 40.7	10 56.1	+ 7 54.2	−0.6205	0.5757	0.1881	+ 2	−75
σ Leonis	4	0.18	2.5	6 38.9	14 1.6	+10 53.1	+0.8312	0.5746	0.1906	+90	+13
b Virginis	6	0.38	2.0	4 17.0	24 6 57.9	+ 3 13.3	−0.1120	0.5703	0.1999	+29	−42
10 Virginis	6½	+0.43	− 2.1	+ 2 32.0	11 14.9	+ 7 21.3	+0.7859	0.5689	−0.2013	+90	+ 8
γ Virginis *mult.*	2½	0.62	1.9	− 0 49.8	25 1 25.0	− 2 58.2	+1.2930	0.5662	0.2034	+89	+51
65 Virginis	6	0.90	1.5	4 20.0	19 54.0	− 9 7.8	+1.0890	0.5656	0.2001	+86	+29
66 Virginis	6	0.90	1.5	4 34.4	20 26.4	− 8 36.5	+1.2220	0.5654	0.2000	+85	+42
80 Virginis	6	0.97	1.2	4 49.2	26 1 19.8	− 3 53.2	+0.4982	0.5650	0.1960	+67	− 8
88 Virginis	6½	+1.03	− 1.2	− 6 16.4	7 0.9	+ 1 36.0	+0.8533	0.5653	−0.1948	+84	+12
ξ^1 Libræ	6	1.48	− 0.2	11 26.2	27 12 14.6	+ 5 48.7	+0.7297	0.5682	0.1706	+79	+ 5
ξ^2 Libræ	5½	1.49	+ 0.2	10 57.2	13 17.9	+ 6 49.8	+0.0578	0.5682	0.1694	+35	−32
17 Libræ	7	1.50	0.4	10 41.9	13 57.6	+ 7 28.0	−0.3147	0.5682	0.1684	+14	−55
18 Libræ	6½	1.50	0.5	10 41.4	14 14.6	+ 7 43.8	−0.3691	0.5682	0.1681	+12	−58
B. A. C. 5070	6	+1.66	+ 1.2	−11 57.9	28 1 10.6	− 5 42.6	−0.8379	0.5701	−0.1550	−17	−90
γ Libræ	4½	1.75	1.0	14 24.7	6 13.1	− 0 50.8	+0.9059	0.5711	0.1484	+76	+17
η Libræ	6	1.80	1.2	15 18.8	9 55.7	+ 2 43.9	+1.2940	0.5722	0.1430	+75	+59
48 Libræ	5½	1.85	2.3	13 57.2	16 4.7	+ 8 39.6	−0.9552	0.5731	−0.1342	−27	−90
49 Libræ	6	1.90	1.8	16 12.0	16 59.9	+ 9 32.9	+1.2350	0.5731	0.1325	+74	+48
ϕ Ophiuchi	4½	+2.06	+ 3.5	−16 21.8	29 6 15.2	− 1 40.3	−0.2120	0.5757	−0.1113	+14	−48
24 Scorpii	5½	2.12	3.9	17 31.2	10 42.6	+ 2 37.5	+0.5069	0.5758	0.1033	+56	− 7
29 Ophiuchi	6½	2.22	4.7	18 43.0	19 22.4	+10 58.5	+0.9204	0.5768	0.0883	+71	+19
15 Sagittarii	6	2.52	8.3	20 45.5	31 2 39.0	− 6 53.0	+1.2400	0.5775	0.0278	+69	+55
16 Sagittarii	6½	2.52	8.4	20 25.1	2 39.5	− 6 52.5	+0.8829	0.5775	0.0276	+70	+18
21 Sagittarii	5	+2.54	+ 9.0	−20 35.9	6 59.5	− 2 41.9	+0.9718	0.5773	−0.0193	+69	+24
29 Sagittarii	5½	2.59	10.3	20 26.9	17 27.2	+ 7 23.1	+0.7271	0.5771	+0.0016	+69	+ 7
ξ^1 Sagittarii	5½	2.62	10.7	20 48.0	20 45.3	+10 34.2	+1.1130	0.5771	0.0081	+69	+36
Lalande 35497	6½	+2.60	+11.2	−19 24.2	23 15.6	−11 0.9	−0.3352	0.5771	+0.0128	− 3	−57
AUGUST.											
B. A. C. 6536	6	+2.61	+11.4	−19 27.8	1 1 31.3	− 8 50.0	−0.2381	0.5741	+0.0175	+ 4	−50
d Sagittarii	5	2.62	12.0	19 9.0	5 35.9	− 4 54.2	−0.4842	0 5733	0.0255	− 9	−69
ρ^3 Sagittarii	6½	2.62	12.3	18 30.8	7 26.6	− 3 7.5	−1.1080	0.5733	0.0288	−50	−90
B. A. C. 6707	6½	+2.63	+12.9	−19 5.9	13 49.6	+ 3 2.1	−0.2677	0.5714	+0.0408	+ 4	−52
B. A. C. 6710	6	+2.63	+13.0	−18 28.8	14 6.9	+ 3 18.7	−0.9133	0.5711	+0.0416	−33	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
f Sagittarii	5	+2.65	+13.3	−20 1.7	1 18 11.9	+ 7 15.1	+0.9202	0.5702	+0.0489	+70	+19
57 Sagittarii	6	2.64	13.6	19 19.6	20 47.4	+ 9 45.2	+0.3038	0.5688	0.0536	+37	−18
σ Capricorni	5½	2.64	14.7	19 28.0	2 8 57.4	− 2 29.2	+1.2435	0.5639	0.0758	+71	+53
π Capricorni	5	2.62	15.0	18 34.6	12 33.8	+ 0 58.9	+0.5715	0.5620	0.0807	+54	− 3
ρ Capricorni	5½	2.62	15.1	18 10.8	13 16.3	+ 1 40.0	+0.2036	0.5620	0.0820	+34	−24
ο Capricorni	6	+2.63	+15.1	−18 57.0	13 43.7	+ 2 6.5	+1.0670	0.5620	+0.0831	+71	+31
υ Capricorni	5½	2.61	15.6	18 31.9	18 22.6	+ 6 36.0	+1.0230	0.5603	0.0902	+71	+27
B. A. C. 7263	6	2.58	16.1	16 27.7	3 2 32.5	− 9 30.5	−0.4137	0.5567	0.1030	+ 3	−62
29 Capricorni	5½	2.56	16.5	15 38.2	11 1.1	− 1 18.8	−0.3820	0.5524	0.1150	+ 6	−60
42 Capricorni	5½	2.50	17.0	14 32.7	23 20.8	+10 37.3	−0.0488	0.5458	0.1305	+25	−39
44 Capricorni	6	+2.50	+17.1	−14 54.7	4 0 4.3	+11 19.2	+0.4430	0.5453	+0.1314	+55	−11
45 Capricorni	6½	2.49	17.1	15 15.7	0 31.4	+11 45.5	+0.8825	0.5448	0.1320	+75	+15
μ Capricorni	5	2.47	17.1	14 4.7	5 1.1	− 7 53.4	+0.2046	0.5429	0.1373	+40	−24
e^3 Aquarii	5½	2.43	17.1	12 6.9	13 33.8	+ 0 23.3	−0.7218	0.5390	0.1464	−10	−90
42 Aquarii	6	2.41	17.4	13 23.3	16 36.8	+ 3 20.6	+1.1160	0.5374	0.1491	+77	+33
σ Aquarii	5	+2.36	+17.2	−11 15.1	23 33.3	+10 4.3	−0.1551	0.5347	+0.1559	+23	−45
58 Aquarii	6½	2.36	17.1	11 28.7	5 0 4.4	+10 34.5	+0.1734	0.5344	0.1564	+41	−26
70 Aquarii	6	2.32	17.1	11 8.9	8 35.7	− 5 9.8	+1.1740	0.5307	0.1631	+79	+38
Lalande 44734	6½	2.31	17.1	10 39.3	10 45.1	− 3 4.2	+0.9854	0.5296	0.1645	+79	+22
k^1 Aquarii	5½	2.26	16.5	8 17.9	17 9.3	+ 3 8.6	−0.5346	0.5268	0.1688	+ 4	−71
χ Aquarii	5½	+2.23	+16.4	− 8 20.3	23 13.1	+ 8 1.7	+0.5450	0.5249	+0.1725	+69	− 6
24 Piscium	6½	2.11	15.0	3 46.8	6 18 11.6	+ 3 27.2	−1.1290	0.5196	0.1805	−33	−90
27 Piscium	5	2.10	14.8	4 10.8	21 15.3	+ 6 25.6	−0.1308	0.5186	0.1815	+27	−43
29 Piscium	5	2.09	14.6	3 39.2	22 55.7	+ 8 3.2	−0.4089	0.5180	0.1818	+13	−61
4 Ceti	6	2.06	14.3	3 10.4	7 2 4.8	+11 6.9	−0.3647	0.5176	0 1825	+16	−58
5 Ceti	6	+2.06	+14.3	− 3 4.5	2 19.9	+11 12.7	−0.4273	0.5176	+0.1825	+12	−62
B. A. C. 5	5½	2.06	14.3	2 51.0	2 36.3	+11 37.5	−0.6292	0.5176	0.1830	+ 1	−80
14 Ceti	6	1.96	13.0	1 7.4	16 58.8	+ 1 35.5	+0.1033	0.5148	0.1845	+41	−30
15 Ceti	6½	1.96	12.8	− 1 7.4	18 21.2	+ 2 55.5	+0.3562	0.5146	0.1845	+57	−16
26 Ceti	6	1.86	11.4	+ 0 45.8	8 8 11.5	− 7 37.6	+0.8208	0.5146	0.1843	+90	+10
29 Ceti	6½	+1.85	+11.1	+ 1 24.4	10 26.4	− 5 26.5	+0.5213	0.5148	+0.1840	+70	− 8
33 Ceti	6	1.84	10.9	1 50.9	11 49.5	− 4 5.6	+0.2847	0.5148	0.1838	+53	−20
35 Ceti	6½	1.83	10.8	1 52.7	12 53.1	− 3 3.8	+0.4474	0.5148	0.1836	+64	−11
f Piscium	5	1.82	10.3	3 1.3	15 42.8	− 0 18.2	−0.3032	0.5150	0.1830	+19	−53
ν Piscium	4½	1.74	8.7	4 55.0	9 4 22.0	+11 58.6	−0.1089	0.5158	0.1794	+29	−41
64 Ceti	5½	+1.64	+ 6.5	+ 8 2.5	20 13.4	+ 3 22.9	−0.7698	0.5190	+0.1726	− 7	−82
ξ^1 Ceti	4½	1.63	6.3	8 19.1	21 5.0	+ 4 12.9	−0.9262	0.5195	0.1722	−17	−82
ξ^2 Ceti	4½	1.55	5.8	7 57.3	10 5 2.0	+11 56.1	+0.8218	0.5214	0.1675	+90	+13
B. A. C. 830	6	1.50	4.3	10 15.6	12 26.2	− 4 52.7	−0.4955	0.5243	0.1625	+ 8	−64
μ Ceti	4½	1.48	4.4	9 38.3	13 42.0	− 3 39.1	+0.3946	0.5248	0.1617	+60	−11
f Tauri	4	+1.28	+ 1.4	+12 32.9	11 12 55.0	− 5 8.0	+0.7292	0.5344	+0.1413	+90	+11
48 Tauri	6	1.08	− 1.2	15 7.2	12 10 39.8	− 8 4.5	+0.7406	0.5467	0.1164	+90	+15
γ Tauri	4	1.08	1.5	15 21.2	12 33.8	− 6 14.1	+0.7050	0.5476	0.1135	+90	+13
δ^1 Tauri	4	1.07	2.3	17 16.7	14 0.7	− 4 50.1	−1.2110	0.5487	0.1117	−45	−73
63 Tauri	6	1.05	2.1	16 30.7	14 15.2	− 4 36.0	−0.3562	0.5489	0.1113	+16	−47
δ^3 Tauri	5½	+1.06	− 2.3	+17 10.9	14 33.5	− 4 18.4	−1.0450	0.5492	+0.1110	−28	−73
70 Tauri	6½	1.04	1.9	15 40.9	15 18.4	− 3 35.0	+0.6564	0.5496	0.1101	+86	+10
71 Tauri	6	1.03	1.8	15 21.6	15 39.2	− 3 14.8	+1.0400	0.5496	0.1093	+90	+35
75 Tauri	6½	1.03	2.1	16 6.4	16 37.7	− 2 18.1	+0.3430	0.5500	0.1081	+57	− 8
θ^1 Tauri	4	1.02	1.9	15 42.6	16 41.7	− 2 14.4	+0.7773	0.5500	0.1081	+90	+18
θ^2 Tauri	4	+1.02	− 1.9	+15 37.1	16 44.3	− 2 11.8	+0.8796	0.5500	+0.1079	+90	+23
80 Tauri	6½	1.01	2.0	15 23.3	17 26.2	− 1 31.3	+1.2050	0.5508	0.1069	+90	+53
B. A. C. 1391	5	1.01	2.1	15 56.8	17 37.1	− 1 20.8	+0.6230	0.5509	0.1067	+82	+ 8
81 Tauri	6½	1.01	1.9	15 26.7	17 40.3	− 1 17.6	+1.1670	0.5509	0·1067	+90	+48
85 Tauri	6½	1.01	2.0	15 36.5	18 14.3	− 0 44.8	+1.0520	0.5512	0.1061	+90	+37
α Tauri	1	+1.00	− 2.4	+16 16.9	20 7.1	+ 1 4.4	+0.5234	0.5517	+0.1033	+71	+ 4
B. A. C. 1526	5½	+0.89	− 3.3	+16 58.4	13 5 59.7	+10 37.2	+0.7254	0.5577	+0.0883	+90	+17

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0. Δα	Red'ns from 1887.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
m Tauri	5½	+0.85	− 4.1	+18 29.5	13 10 30.2	− 9 1.6	−0.5159	0.5611	+0.0813	+ 6	−55
115 Tauri	6	0.74	4.5	17 51.8	19 22.7	− 0 27.4	+0.8106	0.5663	0.0665	+90	+24
119 Tauri	5	0.72	4.8	18 30.4	21 35.8	+ 1 41.0	+0.2739	0.5676	0.0627	+52	− 6
120 Tauri	6	0.71	4.9	18 27.4	22 10.8	+ 2 14.8	+0.3605	0.5684	0.0615	+59	− 1
127 Tauri	6½	0.68	5.1	18 55.3	14 2 17.2	+ 6 12.6	+0.1039	0.5699	0.0547	+42	−15
χ^1 Orionis	4½	+0.65	− 5.8	+20 15.2	7 16.6	+11 1.3	−1.0510	0.5724	+0.0451	−30	−70
χ^2 Orionis	6	0.64	5.7	19 43.5	7 31.2	+11 15.5	−0.4860	0.5728	0.0444	+ 8	−49
χ^3 Orionis	6	0.58	5.8	19 41.4	11 11.8	− 9 11.9	−0.2959	0.5750	0.0376	+19	−36
χ^4 Orionis	5	0.59	5.9	20 8.3	11 23.3	− 9 0.8	−0 7958	0.5753	0.0369	−11	−70
68 Orionis	6	0.55	6.0	19 48.8	14 52.6	− 5 39.0	−0.3007	0.5775	0.0306	+18	−35
71 Orionis	6	+0.54	− 5.9	+19 11.5	16 6.2	− 4 28.2	+0.3875	0.5775	+0.0279	+61	+ 4
16 Geminorum	6½	0.48	6.5	20 33.7	21 38.5	+ 0 52.1	−0.9183	0.5801	0.0170	−20	−69
ν Geminorum	4½	0.47	6.4	20 16.9	22 4.6	+ 1 17.9	−0.6191	0.5805	+0.0161	0	−58
ζ Geminor. *var.*	4	0.33	6.6	20 44.0	15 12 47.2	− 8 32.1	−1.0620	0.5871	−0.0139	−31	−69
56 Geminorum	5½	0.25	6.8	20 39.3	20 10.1	− 1 25.9	−1.1370	0.5893	0.0295	−39	−69
61 Geminorum	6	+0.23	− 6.7	+20 28.8	22 13.3	+ 0 32.6	−1.0210	0.5897	−0.0339	−28	−70
g Geminorum	5½	0.16	6.3	18 47.0	16 6 7.1	+ 8 7.6	+0.3850	0.5916	0.0505	+60	+ 2
3 Cancri	6	0.13	6.0	17 36.9	12 7.0	−10 6.2	+1.2340	0.5928	0.0631	+90	+61
ζ^1 Cancri	4½	0.10	5.9	17 59.1	16 45.3	− 5 38.6	+0.5424	0.5938	0.0730	+73	+ 8
d^1 Cancri	6	0.06	5.9	18 41.6	21 16.8	− 1 17.5	−0.5286	0.5938	0.0818	+ 6	−56
d^2 Cancri	6	+0.06	− 5.7	+17 25.0	22 18.7	− 0 18.0	+0.6773	0.5940	−0.0842	+90	+15
θ Cancri	5½	0.05	5.8	18 28.4	17 0 37.6	+ 1 55.6	−0.5902	0.5940	0.0887	+ 2	−61
MERCURY				18 9.1	3 47.0	+ 4 57.7	−0.5592	0.5504	0.0954	+ 4	−60
δ Cancri	4	0.02	5.8	18 34.0	5 56.1	+ 7 1.8	−1.1830	0.5940	0.0995	−43	−71
o^1 Cancri	5½	0.01	5.2	15 45.3	11 4.4	+11 58 3	+1.1110	0.5942	0.1095	+90	+43
				NEW	*MOON.*						
χ Leonis	4½	+0.04	− 2.3	+ 7 56.8	19 15 41.8	− 9 23.9	+0.8331	0.5849	−0.1873	+90	+14
σ Leonis	4	0.08	1.9	6 38.9	22 27.5	− 2 53.2	+0.8299	0.5835	0.1934	+90	+14
b Virginis	6	0.20	1.1	4 17.0	20 14 54.0	−11 2.9	−0.0973	0.5799	0.2032	+30	−40
10 Virginis	6½	+0.24	− 1.0	+ 2 32.0	19 3.1	− 7 2.8	+0.7870	0.5788	−0.2048	+90	+ 8
γ Virginis *mult.*	2½	0.37	0.7	− 0 49.8	21 8 47.5	+ 6 11.8	+1.2870	0.5761	0.2068	+89	+50
65 Virginis	6	0.57	0.1	4 20.0	22 2 44.0	− 0 30.3	+1.0860	0.5742	0.2033	+86	+29
66 Virginis	6	0.58	− 0.1	4 34.4	3 15.5	+ 0 0.1	+1.2190	0.5741	0.2032	+85	+41
80 Virginis	6	0.63	+ 0.2	4 49.2	8 0.9	+ 4 35.3	+0.5017	0.5735	0.2006	+67	− 8
88 Virginis	6½	+0.70	+ 0.1	− 6 16.4	13 32.7	+ 9 55.3	+0.8551	0.5735	−0.1978	+84	+12
ξ^1 Libræ	6	1.09	1.4	11 26.2	23 18 7.7	−10 30.9	+0.7304	0.5725	0.1719	+79	+ 5
ξ^2 Libræ	5½	1.10	1.6	10 57.2	19 9.8	− 9 31.1	+0.0658	0.5733	0.1708	+35	−32
17 Libræ	7	1.10	1.7	10 41.9	19 48.8	− 8 53.4	−0.3035	0.5733	0.1702	+15	−54
18 Libræ	6½	1.14	1.7	10 41.4	20 5.5	− 8 37.3	−0.3591	0.5733	0.1696	+12	−58
B. A. C. 5070	6	+1.26	+ 2.4	−11 57.9	24 6 51.3	+ 1 45.4	−0.8237	0.5737	−0.1561	−16	−90
γ Libræ	4½	1.35	2.1	14 24.7	11 50.3	+ 6 33.7	+0.9049	0.5738	0.1489	+76	+17
η Libræ	6	1.40	2.3	15 18.8	15 30.4	+10 5.8	+1.2910	0.5745	0.1437	+75	+58
48 Libræ	5½	1.46	3.3	13 57.1	21 36.0	− 8 1.7	−0.9488	0.5751	0.1344	−27	−90
49 Libræ	6	1.50	2.6	16 12.0	22 30.7	− 7 9.0	+1.2300	0.5751	0.1329	+74	+48
φ Ophiuchi	4½	+1.67	+ 4.0	−16 21.8	25 11 41.7	+ 5 33.5	−0.2096	0.5757	−0.1112	+14	−48
24 Scorpii	5½	1.74	4.0	17 31.2	16 8.5	+ 9 50.7	+0.5078	0.5757	0.1033	+56	− 7
29 Ophiuchi	6½	1.85	4.7	18 43.0	26 0 48.1	− 5 48.4	+0.9204	0.5765	0.0881	+71	+19
15 Sagittarii	6	2.24	8.0	20 45.5	27 8 15.2	+ 0 26.6	+1.2430	0.5742	0.0277	+69	+55
16 Sagittarii	6½	2.23	8.1	20 25.1	8 15.6	+ 0 30.9	+0.8543	0.5742	0.0277	+70	+17
21 Sagittarii	5	+2.29	+ 8.6	−20 36.0	12 38.3	+ 4 44.2	+0.9738	0.5735	−0.0190	+69	+24
29 Sagittarii	5½	2.37	9.9	20 26.9	23 12.4	− 9 4.3	+0.7263	0.5724	+0.0014	+69	+ 6
ξ^1 Sagittarii	5½	2.39	10.0	20 48.0	28 2 33.1	− 5 50.7	+1.1180	0.5715	0.0080	+69	+37
Lalande 35497	6½	2.40	10.7	19 24.2	5 5.3	− 3 23.9	−0.3363	0.5705	0.0131	− 3	−57
B. A. C. 6536	6	2.41	11.0	19 27.8	7 22.5	− 1 11.7	−0.2412	0.5702	0.0170	+ 4	−50
d Sagittarii	5	+2.43	+11.4	−19 9.0	11 30.3	+ 2 47.6	−0.4876	0.5682	+0.0250	− 9	−69
ρ^2 Sagittarii	6½	+2.44	+11.8	−18 30.8	13 22.5	+ 4 35.8	−1.1150	0.5682	+0.0284	−50	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0. Δα	Red'ns from 1887.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
B. A. C. 6707	6½	+2.50	+12.4	-19 5.9	28 19 50.5	+10 50.3	-0.2709	0.5671	+0.0416	+ 4	-53
B. A. C. 6710	6	2.50	12.5	18 28.8	20 7.8	+11 7.0	-0.9198	0.5669	0.0416	-34	-90
f Sagittarii	5	2.54	12.6	20 1.7	29 0 16.0	- 8 53.4	+0.9215	0.5645	0.0488	+70	+20
57 Sagittarii	6	2.54	13.0	19 19.6	2 53.6	- 6 21.2	+0.3054	0.5641	0.0532	+38	-18
σ Capricorni	5½	2.61	14.1	19 28.0	15 13.3	+ 5 33.3	+1.2490	0.5595	0.0752	+71	+55
π Capricorni	5	+2.62	+14.6	-18 34.7	18 52.5	+ 9 5.0	+0.5764	0.5580	+0,0804	+60	- 3
ρ Capricorni	5½	2.62	14.7	18 10.9	19 35.5	+ 9 46.6	+0.2082	0.5580	0.0817	+35	-24
o Capricorni	6	2.63	14.5	18 57.1	20 3.3	+10 13.5	+1.0770	0.5580	0.0826	+71	+32
υ Capricorni	5½	2.64	15.5	18 31.9	30 0 45.6	- 9 13.6	+1.0290	0.5554	0.0897	+71	+27
B. A. C. 7263	6	2.65	16.1	16 27.7	9 1.3	- 1 14.3	-0 4134	0.5525	0.1024	+ 3	-62
29 Capriconri	5½	+2.65	+16.8	-15 38.2	17 35.6	+ 7 3.2	-0.3805	0.5491	+0.1145	+ 6	-60
42 Capricorni	5½	2.67	17.5	14 32.7	31 6 2.6	- 4 53.6	-0.0418	0.5438	0.1305	+26	-38
44 Capricorni	6	2.67	17.5	14 54.7	6 46.5	- 4 11.0	+0.4509	0.5436	0.1311	+56	-11
45 Capricorni	6½	2.67	17.5	15 15.7	7 13.8	- 3 44.6	+0.8946	0.5433	0.1316	+75	+16
μ Capricorni	5	2.67	17.7	14 4.7	11 45.9	+ 0 39.0	+0.2149	0.5413	0.1372	+41	-24
e^2 Aquarii	5½	+2.66	+18.1	-12 6.9	20 22.5	+ 8 59.5	-0.7136	0.5371	+0.1462	- 9	-90
42 Aquarii	6	+2.65	+18.1	-13 23.3	23 26.6	+11 58.0	+1.1350	0.5354	+0.1493	+77	+34

SEPTEMBER.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
σ Aquarii	5	+2.65	+18.2	-11 15.1	1 6 25.5	- 5 16.0	-0.1426	0.5327	+0.1556	+23	-44
58 Aquarii	6½	2.65	18.2	11 28.7	6 56.9	- 4 45.5	+0.1884	0.5327	0.1562	+42	-25
70 Aquarii	6	2.64	18.3	11 8.9	15 30.6	+ 3 32.7	+1.1950	0.5304	0.1633	+79	+41
Lalande 44734	6½	2.63	18.3	10 39 3	17 40.4	+ 5 38.7	+1.0070	0.5294	0.1648	+79	+24
h^1 Aquarii	5½	2.62	18.2	8 17.9	2 0 6.0	+11 52.8	-0.5147	0.5273	0.1693	+ 5	-71
χ Aquarii	5½	+2.61	+18.1	- 8 20.3	6 10.8	- 6 13.1	+0.5699	0.5248	+0.1728	+73	- 4
24 Piscium	6½	2.58	17.6	3 46.7	3 1 10.6	-11 46.2	-1.1000	0.5202	0.1814	-31	-90
27 Piscium	5	2.56	17.4	4 10.7	4 14.5	- 8 47.7	-0.0996	0.5194	0.1822	+29	-41
29 Piscium	5	2.55	17.3	3 39.1	5 54.8	- 7 10.2	-0.3782	0.5189	0.1827	+14	-59
4 Ceti	6	2.55	17.1	3 10.3	9 3.9	- 4 6.5	-0.3346	0.5188	0.1836	+17	-57
5 Ceti	6	+2.55	+17.1	- 3 4.4	9 19.0	- 3 51.8	-0.3977	0.5188	+0.1838	+14	-62
B. A. C. 5	5½	2.55	17 0	2 50.9	9 35.4	- 3 35.9	-0.5971	0.5188	0.1838	+ 3	-80
10 Ceti	6	2.53	16.3	0 40.2	19 10.1	+ 5 42.5	-1·2450	0.5154	0 1850	-44	-90
14 Ceti	6	2.51	16.0	1 7.3	23 57.7	+10 22.0	+0.1442	0.5154	0.1855	+44	-28
15 Ceti	6½	2.50	15.8	- 1 7.3	4 1 20.0	+11 41.9	+0.3982	0.5154	0.1858	+59	-14
26 Ceti	6	+2.45	+14.6	+ 0 45.8	15 10.3	+ 1 8.8	+0.8724	0.5154	+0.1850	+90	+13
29 Ceti	6½	2.44	14.4	1 24.4	17 25.0	+ 3 19.8	+0.5705	0.5153	0.1847	+74	- 4
33 Ceti	6	2.44	14.2	1 50.9	18 48.2	+ 4 40.6	+0.3352	0.5154	0.1845	+56	-17
35 Ceti	6½	2.43	14.1	1 52.7	19 52.0	+ 5 42.6	+0.4982	0.5154	0.1843	+68	- 8
f Piscium	5	2.43	13.7	3 1.3	22 41.8	+ 8 27.5	-0.2519	0.5156	0.1838	+22	-51
ν Piscium	4½	+2.38	+12.3	+ 4 55.1	5 11 21.9	- 3 13.9	-0.0519	0.5169	+0.1802	+33	-37
64 Ceti	5½	2.33	10.1	8 2.6	6 3 16.4	-11 46.6	-0.7117	0.5188	0.1729	- 4	-83
ξ^1 Ceti	4½	2.34	10.0	8 19.2	4 8.2	-10 56.2	-0.8670	0 5193	0.1723	-13	-82
ξ^2 Ceti	4½	2.27	9.3	7 57.4	12 7.6	- 3 10.7	+0.8913	0.5204	0.1675	+90	+18
B. A. C. 830	6	2.24	7.9	10 15.6	19 35.0	+ 4 3.7	-0.4281	0.5225	0.1626	+12	-58
μ Ceti	4½	+2.23	+ 8.0	+ 9 38.3	20 51.3	+ 5 17.8	+0.4660	0.5225	+0.1613	+65	- 7
Lalande 5725	6	2.18	5.9	12 45.3	7 7 53.6	- 7 59.5	-1.2390	0.5264	0.1527	-46	-77
f Tauri	4	2.07	4.5	12 33.0	20 19.0	+ 4 3.6	+0 8097	0.5311	0.1408	+90	+16
48 Tauri	6	1.90	1.4	15 7.2	8 18 24.3	+ 1 27.7	+0.8273	0.5417	0.1151	+90	+20
γ Tauri	4	1.89	1.2	15 21.2	20 20.5	+ 3 20.2	+0.7912	0.5419	0.1129	+90	+18
δ^1 Tauri	4	+1.89	+ 0.2	+17 16.7	21 48.9	+ 4 45.8	-1.1390	0.5434	+0.1109	-37	-73
63 Tauri	6	1.87	0.5	16 30.7	22 3.8	+ 5 0.2	-0.2776	0.5434	0.1105	+20	-42
δ^2 Tauri	5½	1.89	0.3	17 10.9	22 22.4	+ 5 18.2	-0.9727	0.5434	0.1102	-22	-73
70 Tauri	6½	1.85	0.7	15 40.9	23 8.2	+ 6 2.6	+0.7423	0.5441	0.1089	+90	+15
71 Tauri	6	1.84	0.8	15 21.6	23 29.5	+ 6 23.3	+1.1320	0.5445	0.1085	+90	+44
75 Tauri	6½	+1.84	+ 0.4	+16 6.4	9 0 29.1	+ 7 20.9	+0.4283	0.5450	+0.1073	+63	- 3
θ^1 Tauri	4	+1.84	+ 0.5	+15 42.6	0 33.1	+ 7 24.9	+0.8676	0.5450	+0.1072	+90	+23

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
θ^2 Tauri	4	+1.83	+0.6	+15 37.1	9 0 35.8	+ 7 27.5	+0.9709	0.5450	+0.1072	+90	+30
B. A. C. 1391	5	1.83	0.3	15 56.8	1 29.6	+ 8 19.5	+0.7082	0.5450	0.1056	+90	+14
81 Tauri	6½	1.82	0.5	15 26.7	1 33.0	+ 8 22.8	+1.2590	0.5450	0.1056	+90	+59
85 Tauri	6½	1.82	+0.4	15 36.5	2 7.5	+ 8 56.2	+1.1410	0.5450	0.1051	+90	+45
α Tauri	1	1.81	0.0	16 16.9	4 2.6	+10 47.6	+0.6075	0.5458	0.1020	+80	+ 8
B. A. C. 1526	5½	+1.71	-1.2	+16 58.5	14 7.7	- 3 27.1	+0.8110	0.5518	+0.0873	+90	+22
m Tauri	5½	1.67	2.1	18 29.6	18 44.4	+ 1 0.4	-0.4417	0.5531	0.0802	+11	-50
115 Tauri	6	1.57	2.9	17 51.9	10 3 49.4	+ 9 47.1	+0.8982	0.5589	0.0654	+90	+30
119 Tauri	5	1.55	3.4	18 30.4	6 5.8	+11 58.8	+0.3518	0.5601	0.0617	+58	- 2
120 Tauri	6	1.54	3.5	18 27.4	6 41.5	-11 26.6	+0.4411	0.5604	0.0608	+65	+ 4
127 Tauri	6½	+1.49	-3.8	+18 55.3	10 53.9	- 7 22.9	+0.1832	0.5619	+0.0533	+47	-10
χ^1 Orionis	4½	1.45	4.8	20 15.2	16 0.8	- 2 26.7	-0.9858	0.5652	0.0444	-25	-70
χ^2 Orionis	6	1.44	4.6	19 43.5	16 15.8	- 2 12.2	-0.4121	0.5654	0.0439	+12	-44
χ^3 Orionis	6	1.38	4.9	19 41.4	20 2.1	+ 1 26.2	-0.2230	0.5665	0.0368	+23	-31
χ^4 Orionis	5	1.38	5.1	20 8.3	20 13.7	+ 1 37.5	-0.6920	0.5667	0.0365	- 4	-67
68 Orionis	6	+1.33	-5.3	+19 48.8	23 48.3	+ 5 4.6	-0.2279	0.5686	+0.0299	+22	-31
71 Orionis	6	1.31	5.3	19 11.5	11 1 3.8	+ 6 17.4	+0.4682	0.5699	0.0273	+67	+ 8
15 Geminorum	6½	1.25	6.1	20 51.4	6 39.7	+11 41.4	-1.1680	0.5715	0.0169	-43	-69
16 Geminorum	6½	1.25	6.0	20 33.7	6 44.4	+11 46.0	-0.8543	0.5715	0.0167	-15	-69
ν Geminorum	4½	1.24	6.0	20 16.9	7 11.3	-11 48.2	-0.5520	0.5718	+0.0158	+ 4	-52
ζ Geminor. *var.*	4	+1.04	-5.9	+20 44.0	22 16.3	+ 2 44.1	-1.0050	0.5789	-0.0141	-26	-69
56 Geminorum	5½	0.94	7.2	20 39.3	12 5 49.6	+10 0.8	-1.0840	0.5815	0.0295	-33	-69
61 Geminorum	6	0.92	7.3	20 28.8	7 55.7	-11 57.8	-0.9654	0.5822	0.0337	-23	-70
g Geminorum	5½	0.80	7.0	18 47.0	16 0.1	- 4 11.4	+0.4502	0.5837	0.0505	+66	+ 5
ζ^1 Cancri	4½	0.67	6.9	17 59.1	13 2 51.4	+ 6 15.6	+0.6008	0.5865	0.0724	+80	+11
d^1 Cancri	6	+0.62	-7.1	+18 41.6	7 27.9	+10 41.7	-0.4812	0.5874	-0.0818	+ 8	-53
d^2 Cancri	6	0.61	6.8	17 25.0	8 30.9	+11 42.3	+0.7364	0.5879	0.0840	+90	+18
θ Cancri	5½	0.59	7.1	18 28.4	10 52.2	-10 1.8	-0.5466	0.5880	0.0888	+ 5	-57
δ Cancri	4	0.53	7.2	18 34.0	16 15.9	- 4 50.3	-1.1460	0.5888	0.0992	-36	-71
o^1 Cancri	5½	0.48	6.3	15 45.3	21 28.3	+ 0 10.4	+1.1600	0.5888	0.1096	+90	+47
o^2 Cancri	6	+0.48	-6.5	+16 0.8	21 36.4	+ 0 18.1	+0.8820	0.5888	-0.1096	+90	+24
π^1 Cancri	6½	0.42	6.2	15 26.9	14 3 41.4	+ 6 9.3	+0.7501	0.5893	0.1208	+90	+16
π^2 Cancri	6	0.40	6.2	15 24.5	4 52.5	+ 7 17.7	+0.6443	0.5902	0.1231	+84	+ 8
7 Leonis	6½	0.34	5.7	14 52.9	13 22.1	- 8 32.0	+0.0618	0.5901	0.1380	+40	-23
ψ Leonis	6	0.31	5.5	14 32.1	16 35.8	- 5 25.7	-0.0467	0.5899	0.1435	+33	-31
23 Leonis	6½	+0.29	-5.2	+13 35.5	19 36.6	- 2 31.7	+0.4559	0.5898	-0.1486	+65	- 4
ν Leonis	5½	0.28	5.1	12 58.9	22 34.5	+ 0 19.5	+0.6162	0.5895	0.1532	+80	+ 4
α Leonis	1½	0.25	4.8	+12 31.0	15 2 46.3	+ 4 21.7	+0.4129	0.5895	0.1597	+62	- 8
				NEW	*MOON.*						
γ Virginis *mult.*	2½	+0.25	-0.4	- 0 49.8	17 18 34.7	- 6 12.9	+1.2200	0.5835	-0.2106	+89	+41
65 Virginis	6	0.36	+0.5	4 20.0	18 12 1.0	+10 34.7	+1.0000	0.5834	0.2075	+86	+22
66 Virginis	6	0.37	0.6	4 34.4	12 31.4	+11 4.0	+1.1310	0.5834	0.2074	+85	+32
80 Virginis	6	0.39	0.8	4 49.2	17 8.1	- 8 29.5	+0.4223	0.5830	0.2051	+60	-13
88 Virginis	6½	0.44	1.0	6 16.4	22 29.4	- 3 20.1	+0.7623	0.5830	0.2018	+84	+ 7
ξ^1 Libræ	6	+0.71	+2.4	-11 26.2	20 2 7.4	- 0 43.4	+0.6159	0.5830	-0.1755	+75	- 2
ξ^2 Libræ	5½	0.71	2.5	10 57.2	3 7.4	+ 0 14.4	-0.0382	0.5830	0.1747	+30	-38
17 Libræ	7	0.72	2.6	10 41.9	3 45.1	+ 0 50.7	-0.4014	0.5830	0.1736	+10	-61
18 Libræ	6½	0.72	2.6	10 41.4	4 1.3	+ 1 6.2	-0.4577	0.5830	0.1733	+ 8	-65
B. A. C. 5070	6	0.84	3.3	11 57.8	14 26.1	+11 7.8	-0.9249	0.5835	0.1591	-23	-90
γ Libræ	4½	+0.92	+3.1	-14 24.6	19 15.0	- 8 14.0	+0.7776	0.5835	-0.1522	+76	+ 8
η Libræ	6	0.96	3.2	15 18.7	22 48.4	- 4 48.5	+1.1540	0.5835	0.1465	+75	+37
48 Libræ	5½	1.03	4.2	13 57.1	21 4 42.7	+ 0 52.6	-1.0520	0.5835	0.1370	-34	-90
49 Libræ	6	1.02	3.5	16 11.9	5 36.0	+ 1 44.0	+1.0940	0.5835	0.1355	+74	+32
φ Ophiuchi	4½	1.19	4.7	16 21.8	18 24.3	- 9 56.4	-0.3289	0.5835	0.1129	+ 8	-56
24 Scorpii	5½	+1.26	+4.7	-17 31.2	22 44.1	- 5 46.1	+0.3776	0.5835	-0.1051	+47	-14
29 Ophiuchi	6½	+1.37	+5.2	-18 43.0	22 7 11.1	+ 2 22.0	+0.7829	0.5825	-0.0893	+71	+10

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
B. A. C. 6098	6	+1.69	+ 7.0	-20 44.0	23 8 42.4	+ 2 56.8	+1.2500	0.5786	-0.0384	+69	+57
15 Sagittarii	6	1.75	7.4	20 45.5	14 3.7	+ 8 6.4	+1.1060	0.5772	0.0273	+69	+35
16 Sagittarii	6½	1.75	7.4	20 25.1	14 4.2	+ 8 6.9	+0.7508	0.5772	0.0273	+70	+ 8
21 Sagittarii	5	1.81	8.0	20 36.0	18 23.6	-11 43.1	+0.8412	0.5755	-0.0187	+69	+14
29 Sagittarii	5½	1.92	9.0	20 26.9	24 4 51.6	- 1 37.8	+0.5975	0.5733	+0.0019	+55	- 2
ξ^1 Sagittarii	5½	+1.95	+ 9.2	-20 48.0	8 10.7	+ 1 34.3	+0.9858	0.5720	+0.0083	+69	+25
Lalande 35497	6½	1.96	9.9	19 24.2	10 41.8	+ 4 0.0	-0.4622	0.5715	0.0132	- 8	-67
B. A. C. 6536	6	1.98	10.1	19 27.8	12 58.3	+ 6 11.7	-0.3634	0.5699	0.0176	- 4	-59
d Sagittarii	5	2.03	10.5	19 9.0	17 4.8	+10 9.4	-0.6060	0.5682	0.0254	-16	-81
ρ^2 Sagittarii	6½	2.05	11.0	18 30.8	18 56.5	+11 57.1	-1.2320	0.5680	0.0288	-63	-90
B. A. C. 6707	6½	+2.12	+11.4	-19 5.9	25 1 23.4	- 5 49.3	-0.3873	0.5653	+0.0410	- 2	-61
B. A. C. 6710	6	2.12	11.7	18 28.8	1 40.8	- 5 32.6	-1.0350	0.5653	0.0414	-42	-90
f Sagittarii	5	2.18	11.5	20 1.7	5 48.8	- 1 33.3	+0.8042	0.5635	0.0491	+70	+11
57 Sagittarii	6	2.20	12.0	19 19.6	8 26.4	+ 0 59.0	+0.1907	0.5627	0.0538	+31	-25
σ Capricorni	5½	2.29	13.0	19 28.0	20 47.1	-11 5.5	+1.1400	0.5568	0.0753	+71	+38
π Capricorni	5	+2.30	+13.5	-18 34.7	26 0 26.9	- 7 33.2	+0.4704	0.5555	+0.0809	+52	- 9
ρ Capricorni	5½	2.32	13.7	18 10.9	1 10.0	- 6 51.5	+0.1023	0.5551	0.0820	+28	-30
o Capricorni	6	2.33	13.5	18 57.1	1 38.0	- 6 24.4	+0.9694	0.5547	0.0828	+71	+23
υ Capricorni	5½	2.36	13.9	18 32.0	6 21.4	- 1 50.4	+0.9315	0.5535	0.0904	+71	+20
B. A. C. 7263	6	2.40	15.0	16 27.8	14 39.8	+ 6 11.7	-0.5063	0.5499	0.1027	- 3	-70
21 Capricorni	6½	+2.42	+14.6	-17 58.0	16 9.2	+ 7 38.1	+1.2780	0.5488	+0.1049	+72	+59
θ Capricorni	4	2.44	14.9	17 40.7	18 34.1	+ 9 58.3	+1.2230	0.5473	0.1081	+72	+47
29 Capricorni	5½	2.45	15.7	15 38.2	23 17.3	- 9 27.6	-0.4674	0.5455	0.1145	+ 1	-69
42 Capricorni	5½	2.51	16.3	14 32.7	27 11 49.8	+ 2 41.0	-0.1166	0.5403	0.1308	+22	-42
44 Capricorni	6	2.52	16.3	14 54.7	12 34.0	+ 3 23.9	+0.3788	0.5401	0.1315	+52	-15
45 Capricorni	6½	+2.52	+16.2	-15 15.7	13 1.5	+ 3 50.5	+0.8233	0.5396	+0.1322	+75	+12
μ Capricorni	5	2.53	16.7	14 4.7	17 35.8	+ 8 16.3	+0.1460	0.5379	0.1374	+37	-28
σ^2 Aquarii	5½	2.57	17.4	12 6.9	28 2 16.4	- 7 19.2	-0.7734	0.5339	0.1465	-13	-90
42 Aquarii	6	2.59	17.1	13 23.3	5 22.0	- 4 19.2	+1.0800	0.5325	0.1494	+77	+30
σ Aquarii	5	2.60	17.6	11 15.1	12 24.4	+ 2 30.4	-0.1883	0.5297	0.1555	+22	-47
58 Aquarii	6½	+2.61	+17.6	-11 28.7	12 55.8	+ 3 0.9	+0.1431	0.5297	+0.1567	+39	-28
70 Aquarii	6	2.64	17.8	11 8.9	21 33.3	+11 22.9	+1.1620	0.5276	0.1639	+79	+37
Lalande 44734	6½	2.65	17.9	10 39.3	23 44.3	-10 29.9	+0.9761	0.5267	0.1653	+79	+21
h^1 Aquarii	5½	2.67	18.3	8 17.9	29 6 12.3	- 4 13.4	-0.5378	0.5249	0.1698	+ 4	-71
χ Aquarii	5½	2.69	18.1	8 20.3	12 19.6	+ 1 43.2	+0.5563	0.5225	0.1735	+71	- 5
24 Piscium	6½	+2.74	+18.1	- 3 46.7	30 7 25.1	- 3 44.3	-1.0900	0.5190	+0.1825	-30	-90
27 Piscium	5	2.75	18.0	4 10.7	10 29.7	- 4 45.0	-0.0850	0.5186	0.1834	+30	-41
29 Piscium	5	2.76	18.0	3 39.1	12 10.5	+ 0 53.0	-0.3587	0.5181	0.1838	+16	-58
4 Ceti	6	2.76	17.9	3 10.3	15 20.2	+ 3 57.3	-0.3106	0.5181	0.1845	+18	-55
5 Ceti	6	2.76	17.9	3 4.4	15 35.3	+ 4 12.0	-0.3722	0.5181	0.1850	+16	-58
B. A. C. 5	5½	+2.77	+17.9	- 2 50.9	15 51.7	+ 4 27.9	-0.5723	0.5181	+0.1850	+ 4	-74
OCTOBER.											
10 Ceti	6	+2.79	+17.5	- 0 40.2	1 1 28.1	-10 12.0	-1.2080	0.5165	+0.1866	-39	-90
14 Ceti	6	+2.78	+17.3	- 1 7.3	6 16.0	- 5 32.2	+0.1908	0.5162	+0.1869	+46	-25
15 Ceti	6½	2.79	17.1	- 1 7.3	7 38.4	- 4 12.2	+0.4482	0.5159	0.1871	+63	-11
26 Ceti	6	2.79	16.1	+ 0 45.9	21 29.6	+ 9 15.5	+0.9408	0.5154	0.1865	+90	+18
29 Ceti	6½	2.79	15.9	1 24.5	23 44.2	+11 26.4	+0.6427	0.5153	0.1862	+81	- 1
33 Ceti	6	2.80	15.8	1 51.0	2 1 7.5	-11 12.6	+0.4111	0.5154	0.1860	+61	-13
35 Ceti	6½	+2.79	+15.8	+ 1 52.8	2 11.2	-10 10.7	+0.5741	0.5154	+0.1858	+74	- 4
f Piscium	5	2.81	15.6	3 1.4	5 0.9	- 7 26.0	-0.1704	0.5156	0.1853	+27	-45
ν Piscium	4½	2.82	14.2	4 55.1	17 40.7	+ 4 52.5	+0.0481	0.5170	0.1817	+39	-32
64 Ceti	5½	2.83	12.3	8 2.6	3 9 34.4	- 3 41.0	-0.5889	0.5202	0.1745	+ 3	-75
ξ^1 Ceti	4½	2.83	12.3	8 19.2	10 26.2	- 2 50.8	-0.7464	0.5205	0.1741	- 6	-82
ξ^2 Ceti	4½	+2.80	+11.4	+ 7 57.4	18 25.2	+ 4 54.3	+1.0260	0.5213	+0.1689	+90	+27
B. A. C. 830	6	+2.81	+10.2	+10 15.7	4 1 52.6	-11 51.2	-0.2847	0.5238	+0.1640	+20	-50

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
μ Ceti	4½	+2.79	+10.1	+ 9 38.4	4 3 8.9	−10 37.1	+0.6101	0.5242	+0.1631	+79	+ 1
Lalande 5725	6	2.80	8.3	12 45.3	14 11.6	+ 0 6.0	−1.0860	0.5272	0.1541	−30	−77
f Tauri	4	2.73	6.7	12 33.0	5 2 38.9	−11 49.0	+0.9835	0.5311	0.1418	+90	+25
48 Tauri	6	2.63	3.1	15 7.3	6 0 51.7	+ 9 42.6	+1.0190	0.5400	0.1157	+90	+33
γ Tauri	4	2.63	2.9	15 21.2	2 48.6	+11 35.8	+0.9872	0.5409	0.1131	+90	+31
δ^1 Tauri	4	+2.65	+ 2.1	+17 16.7	4 17.8	−10 57.8	−0.9598	0.5420	+0.1115	−21	−73
63 Tauri	6	2.63	2.3	16 30.7	4 32.8	−10 43.2	−0.0896	0.5423	0.1110	+31	−31
δ^2 Tauri	5½	2.64	2.1	17 10.9	4 51.7	−10 25.0	−0.7898	0.5423	0.1107	−10	−73
70 Tauri	6½	2.61	2.4	15 40.9	5 38.0	− 9 40.1	+0.9380	0.5423	0.1094	+90	+28
75 Tauri	6½	2.60	2.1	16 6.4	6 59.5	− 8 21.2	+0.6223	0.5423	0.1076	+82	+ 8
θ^1 Tauri	4	+2.59	+ 2.2	+15 42.6	7 3.6	− 8 17.2	+1.0640	0.5425	+0.1075	+90	+37
θ^2 Tauri	4	2.59	2.2	15 37.1	7 6.3	− 8 14.6	+1.1680	0.5425	0.1075	+90	+47
B. A. C. 1391	5	2.59	2.0	15 56.8	8 0.7	− 7 22.0	+0.9070	0.5430	0.1062	+90	+26
α Tauri	1	2.58	1.6	16 16.9	10 35.2	− 4 52.3	+0.8066	0.5446	0.1026	+90	+20
B. A. C. 1468	6½	2.57	+ 0.2	18 31.7	15 29.5	− 0 7.5	−1.1620	0.5463	0.0955	−40	−71
i Tauri	5½	+2.55	− 0.2	+18 38.8	17 54.6	+ 2 12.9	−1.0620	0.5467	+0.0920	−30	−71
B. A. C. 1526	5½	2.49	0.0	16 58.5	20 47.5	+ 5 0.3	+1.0190	0.5475	0.0875	+90	+36
m Tauri	5½	2.47	1.1	18 29.6	7 1 28.0	+ 9 31.6	−0.2450	0.5508	0.0804	+22	−36
115 Tauri	6	2.37	2.1	17 51.9	10 41.5	− 5 33.2	+1.1100	0.5539	0.0652	+90	+47
119 Tauri	5	2.36	2.6	18 30.5	13 0.4	− 3 18.9	+0.5595	0.5555	0.0619	+76	+ 9
120 Tauri	6	+2.35	− 2.7	+18 27.5	13 36.8	− 2 43.7	+0.6498	0.5559	+0.0605	+86	+15
127 Tauri	6½	2.30	3.3	18 55.3	17 53.8	+ 1 24.8	+0.3903	0.5565	0.0532	+61	+ 1
χ^1 Orionis	4½	2.25	4.4	20 15.2	23 6.8	+ 6 27.0	−0.7918	0.5591	0.0440	−11	−70
χ^2 Orionis	6	2.25	4.2	19 43.5	23 22.2	+ 6 41.9	−0.2100	0.5591	0.0438	+24	−31
χ^3 Orionis	6	2.21	4.6	19 41.4	8 3 13.1	+10 24.9	−0.0179	0.5609	0.0367	+35	−19
χ^4 Orionis	5	+2.21	− 4.7	+20 8.3	3 25.2	+10 36.6	−0.4930	0.5611	+0.0361	+ 8	−50
68 Orionis	6	2.16	5.1	19 48.8	7 4.4	− 9 51.7	−0.0235	0.5620	0.0301	+34	−19
71 Orionis	6	2.14	5.1	19 11.5	8 21.8	− 8 37.0	+0.6805	0.5620	0.0275	+90	+19
15 Geminorum	6½	2.08	6.4	20 51.4	14 5.6	− 3 5.1	−0.9767	0.5648	0.0167	−24	−69
16 Geminorum	6½	2.08	6.4	20 33.7	14 10.5	− 3 0.4	−0.6597	0.5650	0.0164	− 2	−61
ν Geminorum	4½	+2.07	− 6.2	+20 16.9	14 38.0	− 2 33.9	−0.3530	0.5653	+0.0155	+16	−37
ζ Geminor. *var.*	4	1.86	7.9	20 44.0	9 6 6.7	−11 37.7	−0.8164	0.5703	−0.0141	−12	−69
56 Geminorum	5½	1.75	8.5	20 39.3	13 53.3	− 4 7.8	−0.8964	0.5722	0.0294	−18	−69
61 Geminorum	6	1.72	8.6	20 28.8	16 3.2	− 2 2.6	−0.7807	0.5723	0.0335	−10	−70
g Geminorum	5½	1.60	8.5	18 47.0	10 0 22.6	+ 5 59.0	+0.6526	0.5742	0.0500	+87	+17
85 Geminorum	6	+1.55	− 9.3	+20 10.7	4 26.9	+ 9 54.4	−1.0260	0.5758	−0.0585	−28	−70
ζ^1 Cancri	4½	1.43	8.8	17 59.1	11 34.4	− 7 13.4	+0.7973	0.5768	0.0723	+90	+23
d^1 Cancri	6	1.36	9.3	18 41.6	16 19.9	− 2 38.4	−0.3040	0.5771	0.0811	+19	−40
d^2 Cancri	6	1.34	8.9	17 25.0	17 24.8	− 1 35.8	+0.9309	0.5780	0.0836	+90	+31
θ Cancri	5½	1.31	9.4	18 28.3	19 50.6	+ 0 44.6	−0.3707	0.5781	0.0881	+15	−45
δ Cancri	4	+1.22	− 9.5	+18 33.9	11 1 24.9	+ 6 6.7	−0.9845	0.5788	−0.0988	−24	−71
o^2 Cancri	6	1.14	8.8	16 0.8	6 55.6	+11 25.3	+1.0670	0.5788	0.1086	+90	+38
π^1 Cancri	6½	1.05	8.7	15 26.9	13 12.3	− 6 31.8	+0.9249	0.5795	0.1203	+90	+27
π^2 Cancri	6	1.04	8.7	15 24.5	14 25.5	− 5 21.3	+0.8164	0.5795	0.1223	+90	+19
7 Leonis	6½	0.94	8.5	14 52.9	23 10.8	+ 3 4.8	+0.2132	0.5800	0.1371	+49	−17
ψ Leonis	6	+0.90	− 8.4	+14 32.1	12 2 30.1	+ 6 16.7	+0.0997	0.5800	−0.1428	+42	−23
23 Leonis	6½	0.87	8.1	13 35.5	5 36.2	+ 9 16.1	+0.6026	0.5800	0.1473	+79	+ 4
ν Leonis	5½	0.83	7.9	12 58.9	8 39.1	−11 47.7	+0.7596	0.5800	0.1523	+90	+13
α Leonis	1½	0.77	7.7	12 31.0	12 57.7	− 7 38.7	+0.5571	0.5800	0.1588	+74	0
34 Leonis	6½	0.76	7.9	13 54.6	14 18.9	− 6 20.5	−1.0600	0.5800	0.1607	−28	−76
Mars				+13 1.1	15 14.2	− 5 27.2	−0.3138	0.5577	−0.1537	+19	−49
l Leonis	5½	+0.59	− 6.7	11 8.5	13 6 14.9	+ 9 0.4	−1.0160	0.5808	0.1818	−24	−79
χ Leonis	4½	0.56	5.7	7 56.7	12 56.9	− 8 32.4	+0.9189	0.5808	0.1889	+90	+19
B. A. C. 3837	6½	0.52	5.6	8 40.6	16 43.9	− 4 53.8	−0.5279	0.5808	0.1928	+ 7	−67
σ Leonis	4	0.51	5.1	6 38.8	19 45.0	− 1 59.3	+0.8943	0.5815	0.1959	+90	+17
b Virginis	6	+0.43	− 3.6	+ 4 16.9	14 12 7.5	−10 13.0	−0.8688	0.5828	−0.2075	−13	−86
γ Virginis *mult.*	2½	+0.39	− 1.9	− 0 49.8	15 5 40.7	+ 6 41.4	+1.2220	0.5838	−0.2131	+89	+41

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					LIMITING PARALLELS.	
Name.	Mag.	Red'ns from 1887.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° ′	d h m	h m				°	°
				NEW	*MOON.*						
ξ^2 Libræ	5½	+0.51	+ 2.6	-10 57.2	17 13 24.6	-11 40.2	-0.1588	0.5909	-0.1785	+23	-45
17 Libræ	7	0.51	2.7	10 41.9	14 1.5	-11 4.8	-0.5213	0.5920	0.1783	+ 4	-70
18 Libræ	6½	0.51	2.8	10 41.4	14 17.1	-10 49.8	-0.5754	0.5920	0.1780	+ 1	-75
B. A. C. 5070	6	+0.58	+ 3.5	-11 57.8	18 0 24.2	- 1 6.0	-1.0520	0.5925	-0.1635	-32	-90
γ Libræ	4½	0.65	3.7	14 24.6	5 4.7	+ 3 23.8	+0.6145	0.5926	0.1562	+70	- 2
η Libræ	6	0.66	3.7	15 18.7	8 31 2	+ 6 42.3	+0.9800	0.5930	0.1507	+75	+22
48 Libræ	5½	0.69	4.4	13 57.1	14 14.2	-11 47.9	-1.2030	0.5935	0.1409	-49	-90
49 Libræ	6	0.73	4.1	16 11.9	15 5.7	-10 58.4	+0.9072	0.5935	0.1394	+74	+17
φ Ophiuchi	4½	+0.81	+ 5.1	-16 21.8	19 3 28.2	+ 0 55.5	-0.5092	0.5944	-0.1163	- 2	-70
24 Scorpii	5½	0.86	5.3	17 31.2	7 39.0	+ 4 56.6	+0.1790	0.5938	0.1082	+35	-26
29 Ophiuchi	6½	0.95	5.6	18 43.0	15 48.3	-11 12.9	+0.5680	0.5928	0.0916	+59	- 4
B. A. C. 6098	6	1.21	7.2	20 44.0	20 16 27.7	-11 30.2	+1.0070	0.5876	0.0395	+69	+26
μ Sagittarii	4	1.26	7.3	21 5.1	21 2.4	- 7 5.8	+1.2140	0.5850	0.0298	+69	+49
15 Sagittarii	6	+1.26	+ 7.6	-20 45.5	21 38.8	- 6 30.8	+0.8594	0.5850	-0.0283	+69	+15
16 Sagittarii	6½	1.26	7.7	20 25.1	21 39.2	- 6 30.4	+0.5094	0.5850	0.0283	+50	- 7
21 Sagittarii	5	1.31	8.0	20 36.0	21 1 50.6	- 2 28.3	+0.5973	0.5850	0.0197	+56	- 2
B. A. C. 6347	6	1.38	8.2	21 8.6	7 28.5	+ 2 56.8	+1.0860	0.5821	-0.0077	+69	+33
29 Sagittarii	5½	1.41	8.8	20 27.0	12 0.1	+ 7 18.4	+0.3553	0.5809	+0.0016	+36	-16
ξ^1 Sagittarii	5½	+1.46	+ 8.9	-20 48.1	15 13.7	+10 24.9	+0.7377	0.5790	+0.0081	+69	+ 7
ξ^2 Sagittarii	3½	1.47	8.7	21 15.1	15 22.8	+10 33.6	+1.2060	0.5788	0.0089	+69	+48
Lalande 35497	6½	1.47	9.5	19 24.2	17 40.8	-11 13.4	-0.6921	0.5780	0.0132	-22	-90
B. A. C. 6536	6	1.49	9.7	19 27.8	19 53.7	- 9 5.3	-0.5974	0.5773	0.0178	-16	-80
π Sagittarii	3	1.51	9.1	21 11.9	20 29.5	- 8 30.8	+1.2260	0.5767	0.0190	+69	+51
d Sagittarii	5	+1.53	+10.0	-19 9.0	23 53.9	- 5 13.8	-0.8377	0.5740	+0.0277	-29	-90
B. A. C. 6707	6½	1.61	10.6	19 5.9	22 8 0.7	+ 2 35.4	-0.6258	0.5718	0.0415	-16	-83
f Sagittarii	5	1.68	10.6	20 1.7	12 20.4	+ 6 45.9	+0.5547	0.5690	0.0495	+56	- 4
57 Sagittarii	6	1.69	11.0	19 19.6	14 54.5	+ 9 14.6	-0.0529	0.5674	0.0543	+17	-39
σ Capricorni	5½	1.83	11.7	19 28.0	23 3 1.8	- 3 3.4	+0.8900	0.5602	0.0767	+71	+16
π Capricorni	5	+1.85	+12.0	-18 34.7	6 38.3	+ 0 25.7	+0.2260	0.5585	+0.0818	+36	-23
ρ Capricorni	5½	1.86	12.3	18 10.9	7 20.9	+ 1 6.9	-0.1390	0.5585	0.0830	+16	-44
ο Capricorni	6	1.87	12.1	18 57.1	7 48.3	+ 1 33.3	+0.7237	0.5580	0.0837	+73	+ 6
υ Capricorni	5½	1.91	12.5	18 32.0	12 27.8	+ 6 3.4	+0.6858	0.5550	0.0913	+70	+ 3
19 Capricorni	6	1.97	12.9	18 20.9	19 18.2	-11 19.9	+1.1510	0.5512	0.1013	+72	+38
B. A. C. 7263	6	+1.97	+13.6	-16 27.8	20 40.3	-10 0.4	-0.7379	0.5511	+0.1040	-16	-90
21 Capricorni	6½	1.99	13.1	17 58.0	22 8.9	- 8 34.8	+1.0360	0.5499	0.1058	+72	+27
θ Capricorni	4	2.01	13.3	17 40.7	24 0 32.2	- 6 16.1	+0.9838	0.5488	0.1094	+72	+23
29 Capricorni	5½	2.05	14.1	15 38.3	5 13.1	- 1 44.5	-0.6920	0.5463	0.1157	-12	-90
42 Capricorni	5½	2.16	14.8	14 32.8	17 40.8	+10 19.5	-0.3333	0.5398	0.1315	+10	-56
44 Capricorni	6	+2.17	+14.8	-14 54.8	18 24.9	+11 2.2	+0.1615	0.5398	+0.1328	+37	-27
45 Capricorni	6½	2.18	14.6	15 15.8	18 52.3	+11 28.7	+0.6043	0.5396	0.1333	+67	- 2
μ Capricorni	5	2.21	15.0	14 4.7	23 25.6	- 8 6.5	-0.0673	0.5367	0.1386	+25	-40
ι Aquarii	4½	2.27	15.2	14 24.7	25 5 57.9	- 1 46.4	+1.2240	0.5335	0.1453	+76	+45
e^2 Aquarii	5½	2.28	15.9	12 6.9	8 5.2	+ 0 16.9	-0.9746	0.5323	0.1474	-26	-90
42 Aquarii	6	+2.30	+15.6	-13 23.3	11 10.6	+ 3 16.8	+0.8778	0.5314	+0.1506	+77	+14
σ Aquarii	5	2.33	16.2	11 15.1	18 13.0	+10 6.4	-0.3810	0.5292	0.1572	+11	-59
58 Aquarii	6½	2.35	16.1	11 28.7	18 44.6	+10 37.0	-0.0476	0.5288	0.1576	+29	-39
70 Aquarii	6	2.41	16.3	11 8.9	26 3 23.0	- 5 0.0	+0.9835	0.5252	0.1646	+79	+21
Lalande 44734	6½	2.43	16.4	10 39.3	5 34.1	- 2 52.7	+0.8000	0.5238	0.1662	+79	+ 8
k^1 Aquarii	5½	+2.47	+17.0	- 8 17.9	12 3.4	+ 3 25.1	-0.7042	0.5219	+0.1706	- 5	-90
χ Aquarii	5½	2.51	16.8	8 20.3	18 11.8	+ 9 22.8	+0.3996	0.5204	0.1744	+59	-14
24 Piscium	6½	2.65	17.4	3 46.7	27 13 22.3	+ 4 0.3	-1.2090	0.5170	0.1836	-40	-90
27 Piscium	5	2.67	17.1	4 10.7	16 27.7	+ 7 0.4	-0.1960	0.5159	0.1845	+24	-48
29 Piscium	5	2.68	17.2	3 39.1	18 8.8	+ 8 38.8	-0.4714	0.5159	0.1850	+10	-66
4 Ceti	6	+2.71	+17.2	- 3 10.3	21 19.4	+11 43.9	-0.4141	0.5150	+0.1858	+13	-61
5 Ceti	6	+2.71	+17.2	- 3 4.4	21 34.6	+11 58.7	-0.4733	0.5150	+0.1858	+10	-66

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
B. A. C. 5	5½	+2.72	+17.2	− 2 50.9	27 21 51.1	−11 45.3	−0.6730	0.5150	+0.1858	− 1	−85
14 Ceti	6	2.81	16.9	1 7.3	28 12 18.8	+ 2 18.0	+0.1204	0.5142	0.1886	+43	−29
15 Ceti	6½	2.81	16.7	− 1 7.3	13 41.5	+ 3 38.3	+0.3796	0.5142	0.1886	+59	−15
26 Ceti	6	2.88	16.0	+ 0 45.9	29 3 34.8	− 6 51.8	+0.9020	0.5144	0.1884	+90	+15
29 Ceti	6½	2.90	15.9	1 24.5	5 49.8	− 4 40.6	+0.6112	0.5145	0.1879	+78	− 3
33 Ceti	6	+2.91	+15.8	+ 1 51.0	7 13.4	− 3 19.3	+0.3815	0.5145	+0.1879	+59	−16
35 Ceti	6½	2.91	15.7	1 52.8	8 17.2	− 2 17.3	+0.5482	0.5146	0.1878	+72	− 6
f Piscium	5	2.94	15.6	3 1.4	11 7.1	+ 0 27.8	−0.1908	0.5150	0.1873	+26	−46
ν Piscium	4½	3.01	14.6	4 55.1	23 47.3	−11 13.6	+0.0574	0.5172	0.1841	+40	−32
64 Ceti	5½	3.09	12.9	8 2.6	30 15 39.9	+ 4 11.8	−0.5436	0.5201	0.1769	+ 6	−70
ξ^1 Ceti	4½	+3.10	+12.8	+ 8 19.2	16 31.6	+ 5 2.0	−0.6969	0.5205	+0.1764	− 2	−82
ξ^2 Ceti	4½	3.12	11.9	7 57.4	31 0 29.3	−11 14.1	+1.0920	0.5229	0.1720	+90	+32
B. A. C. 830	6	3.17	11.0	10 15.7	7 55.2	− 4 1.2	−0.2048	0.5246	0.1682	+25	−44
μ Ceti	4½	3.16	10.9	9 38.4	9 11.1	− 2 47.5	+0.6937	0.5252	0.1657	+89	+ 5
Lalande 5725	6	+3.22	+ 9.3	+12 45.4	20 11.2	+ 7 53.0	−0.9779	0.5284	+0.1566	−21	−77
NOVEMBER.											
f Tauri	4	+3.21	+ 7.6	+12 33.0	1 8 34.7	− 4 5.8	+1.1140	0.5335	+0.1445	+90	+37
48 Tauri	6	3.22	3.8	15 7.3	2 6 40.9	− 6 40.7	+1.1920	0.5421	0.1181	+90	+49
γ Tauri	4	+3.22	+ 3.4	+15 21.3	8 37.4	− 4 47.9	+1.1650	0.5430	+0.1155	+90	+46
δ^1 Tauri	4	3.24	2.9	17 16.7	10 6.2	− 3 21.9	−0.7769	0.5436	0.1136	− 8	−73
63 Tauri	6	3.23	2.9	16 30.7	10 21.1	− 3 7.5	+0.0914	0.5438	0.1133	+42	−22
δ^2 Tauri	5½	3.24	2.8	17 10.9	10 39.9	− 2 49.3	−0.6070	0.5439	0.1128	+ 2	−64
δ^3 Tauri	5	3.25	2.6	17 40.1	11 19.6	− 2 10.9	−1.0660	0.5439	0.1120	−30	−72
70 Tauri	6½	+3.21	+ 3.0	+15 40.9	11 25.9	− 2 4.8	+1.1250	0.5444	+0.1115	+90	+42
75 Tauri	6½	3.22	2.6	16 6.4	12 47.2	− 0 46.0	+0.8081	0.5445	0.1099	+90	+19
θ^1 Tauri	4	3.21	2.7	15 42.6	12 51.2	− 0 42.1	+1.2500	0.5445	0.1099	+90	+57
B. A. C. 1391	5	3.21	2.6	15 56.8	13 48.2	+ 0 13.0	+1.0930	0.5445	0.1084	+90	+39
α Tauri	1	3.21	2.1	16 16.9	16 22.1	+ 2 42.0	+1.0000	0.5455	0.1050	+90	+33
B. A. C. 1468	6½	+3.23	+ 0.9	+18 31.7	21 15.4	+ 7 25.8	−0.9636	0.5474	+0.0978	−22	−71
i Tauri	5½	3.23	+ 0.5	18 38.8	23 40.0	+ 9 45.7	−0.8616	0.5488	0.0940	−14	−71
m Tauri	5½	3.17	− 0.7	18 29.6	3 7 12.6	− 6 56.5	−0.0291	0.5518	0.0824	+34	−24
119 Tauri	5	3.09	2.5	18 30.5	18 44.6	+ 4 12.6	+0.7902	0.5551	0.0630	+90	+23
120 Tauri	6	3.09	2.7	18 27.5	19 20.9	+ 4 47.7	+0.8825	0.5556	0.0621	+90	+29
127 Tauri	6½	+3.07	− 3.6	+18 55.3	23 38.5	+ 8 56.8	+0.6281	0.5568	+0.0542	+84	+14
χ^1 Orionis	4½	3.04	4.7	20 15.2	4 4 52.1	−10 0.3	−0.5514	0.5585	0.0453	+ 5	−55
χ^2 Orionis	6	3.03	4.6	19 43.5	5 7.5	− 9 45.5	+0.0306	0.5585	0.0449	+38	−18
χ^3 Orionis	6	2.99	5.1	19 41.4	8 59.4	− 6 1.4	+0.2289	0.5605	0.0378	+50	− 6
χ^4 Orionis	5	2.99	5.3	20 8.3	9 11.4	− 5 49.8	−0.2487	0.5607	0.0377	+22	−33
68 Orionis	6	+2.95	− 5.7	+19 48.8	12 51.8	− 2 16.8	+0.2285	0.5616	+0.0308	+50	− 5
71 Orionis	6	2.93	5.7	19 11.5	14 9.6	− 1 1.8	+0.9372	0.5623	0.0286	+90	+36
15 Geminorum	6½	2.89	7.1	20 51.4	19 55.8	+ 4 32.6	−0.7241	0.5627	0.0175	− 6	−70
16 Geminorum	6½	2.90	7.0	20 33.7	20 0.8	+ 4 37.4	−0.4051	0.5630	0.0175	+13	−41
ν Geminorum	4½	2.89	7.0	20 16.9	20 28.3	+ 5 3.9	−0.0968	0.5632	+0.0163	+31	−22
ζ Geminor. *var.*	4	+2.72	− 9.3	+20 43.9	5 12 6.8	− 3 50.1	−0.5516	0.5661	−0.0133	+ 4	−52
56 Geminorum	5½	2.62	10.2	20 39.2	19 59.9	+ 3 46.3	−0.6295	0.5675	0.0286	0	−60
61 Geminorum	6	2.59	10.5	20 28.7	22 11.8	+ 5 53.6	−0.5124	0.5682	0.0327	+ 7	−51
79 Geminorum	6½	2.49	11.4	20 35.0	6 6 12.2	−10 22.9	−0.9453	0.5682	0.0483	−21	−69
g Geminorum	5½	2.45	10.9	18 46.9	6 40.1	− 9 56.0	+0.9401	0.5682	0.0493	+90	+34
85 Geminorum	6	+2.42	−11.9	+20 10.6	10 49.5	− 5 55.5	−0.7570	0.5689	−0.0573	− 8	−70
ζ^1 Cancri	4½	2.28	11.8	17 59.0	18 6.2	+ 1 5.8	+1.0875	0.5696	0.0711	+90	+44
d^1 Cancri	6	2.21	12.4	18 41.5	22 58.6	+ 5 47.8	−0.0261	0.5697	0.0802	+35	−23
d^2 Cancri	6	2.18	12.1	17 24.9	7 0 5.2	+ 6 52.1	+1.2220	0.5697	0.0820	+90	+57
θ Cancri	5½	2.16	12.7	18 28.3	2 34.7	+ 9 16.3	−0.0962	0.5699	0.0871	+30	−28
SATURN				+18 59.8	7 9.5	−10 18.7	−1.0610	0.5689	−0.0950	−30	−71
δ Cancri	4	+2.08	−13.0	+18 33.9	8 17.9	− 9 12.7	−0.7194	0.5699	−0.0972	− 5	−73

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0. Δα	Red'ns from 1887.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
π¹ Cancri	6½	+1.87	-12.4	+15 26.8	7 20 26.5	+ 2 30.1	+1.2140	0.5699	-0.1189	+90	+52
π² Cancri	6	1.85	12.5	15 24.4	21 42.0	+ 3 42.9	+1.1040	0.5694	0.1208	+90	+40
7 Leonis	6½	1.73	12.6	14 52.8	8 6 44.5	-11 33.8	+0.4862	0.5693	0.1354	+68	- 2
ψ Leonis	6	1.67	12.5	14 32.0	10 10.8	- 8 14.9	+0.3671	0.5693	0.1407	+59	- 9
23 Leonis	6½	1.63	12.2	13 35.4	13 23.2	- 5 9.2	+0.8766	0.5689	0.1459	+90	+21
ν Leonis	5½	+1.59	-12.0	+12 58.8	16 32.7	- 2 6.4	+1.0340	0.5689	-0.1507	+90	+31
α Leonis	1½	1.51	11.9	12 30.9	21 0.6	+ 2 11.9	+0.8226	0.5689	0.1570	+90	+16
34 Leonis	6½	1.51	12.3	13 54.5	22 24.6	+ 3 32.9	-0.8245	0.5689	0.1588	-11	-76
l Leonis	5½	1.29	11.2	11 8.4	9 14 56.2	- 4 30.4	-0.8004	0.5689	0.1796	- 9	-79
χ Leonis	4½	1.21	9.9	7 56.6	21 53.2	+ 2 11.8	+1.1560	0.5685	0.1867	+90	+37
B. A. C. 3837	6½	+1.16	-10.0	+ 8 40.5	10 1 48.7	+ 5 59.0	-0.3222	0.5690	-0.1908	+18	-53
MARS				7 1.8	3 3.8	+ 7 11.4	+1.0940	0.5477	0.1832	+90	+31
σ Leonis	4	1.14	9.2	6 38.7	4 56.5	+ 9 0.1	+1.1180	0.5692	0.1935	+90	+33
b Virginis	6	0.96	7.6	4 16.9	21 53.8	+ 1 21.3	+0.0847	0.5710	0.2056	+41	-31
10 Virginis	6½	0.93	6.9	+ 2 31.9	11 2 7.9	+ 5 26.5	+0.9502	0.5718	0.2079	+90	+18
65 Virginis	6	+0.75	- 2.8	- 4 20.0	12 9 46.4	+11 56.6	+1.0470	0.5788	-0.2110	+86	+25
66 Virginis	6	0.74	2.8	4 34.4	10 17.4	-11 33.5	+1.1740	0.5790	0.2110	+85	+36
80 Virginis	6	0.72	2.3	4 49.2	14 56.3	- 7 4.8	+0.4400	0.5812	0.2095	+45	-12
88 Virginis	6½	0.72	- 1.5	6 16.4	20 18.7	- 1 54.3	+0.7508	0.5821	0.2069	+84	+ 5
				NEW	*MOON.*						
φ Ophiuchi	4½	+0.73	+ 4.9	-16 21.8	15 14 17.8	-10 26.7	-0.6357	0.5997	-0.1202	- 9	-83
24 Scorpii	5½	0.75	5.1	17 31.2	18 24.0	- 6 30.1	+0.0381	0.5999	0.1118	+26	-34
29 Ophiuchi	6½	0.78	5.7	18 43.0	16 2 22.7	+ 1 9.7	+0.4077	0.6001	0.0954	+49	-13
B. A. C. 6098	6	0.94	7.2	20 44.0	17 2 22.7	+ 0 13.0	+0.7875	0.5970	0.0422	+69	+10
μ Sagittarii	4	+0.97	+ 7.4	-21 5.1	6 49.2	+ 4 29.1	+0.9815	0.5960	-0.0320	+69	+24
15 Sagittarii	6	0.98	7.6	20 45.5	7 24.4	+ 5 2.9	+0.6313	0.5956	0.0304	+59	0
16 Sagittarii	6½	0.97	7.7	20 25.1	7 24.9	+ 5 3.4	+0.2860	0.5956	0.0304	+34	-20
21 Sagittarii	5	1.01	7.9	20 36.0	11 28.4	+ 8 57.4	+0.3645	0.5938	0.0214	+38	-15
B. A. C. 6347	6	1.06	8.0	21 8.6	16 55.5	- 9 48.2	+0.8381	0.5925	-0.0095	+69	+13
29 Sagittarii	5½	+1.09	+ 8.5	-20 27.0	21 18.6	- 5 35.2	+0.1094	0.5911	+0.0002	+22	-30
33 Sagittarii	6	1.12	8.3	21 29.7	23 3.3	- 3 54.4	+1.1850	0.5895	0.0041	+69	+45
ξ¹ Sagittarii	5½	1.10	8.5	20 48.1	18 0 26.1	- 2 34.8	+0.4829	0.5891	0.0074	+45	- 9
ξ² Sagittarii	3½	1.11	8.4	21 15.1	0 34.8	- 2 26.4	+0.9469	0.5891	0.0075	+69	+21
Lalande 35497	6½	1.12	9.0	19 24.2	2 48.3	- 0 18.0	-0.9333	0.5882	0.0123	-37	-90
B. A. C. 6536	6	+1.14	+ 9.1	-19 27.8	4 57.0	+ 1 45.8	-0.8403	0.5874	+0.0168	-31	-90
π Sagittarii	3	1.16	8.8	21 12.0	5 31.7	+ 2 19.2	+0.9605	0.5865	0.0180	+69	+22
d Sagittarii	5	1.16	9.3	19 9.0	8 49.4	+ 5 29.5	-1.0860	0.5848	0.0251	-49	-90
B. A. C. 6707	6½	1.23	9.9	19 5.9	16 40.7	-10 56.7	-0.8839	0.5812	0.0412	-32	-90
f Sagittarii	5	1.27	9.9	20 1.7	20 52.0	- 6 54.7	+0.2743	0.5780	0.0497	+35	-21
57 Sagittarii	6	+1.29	+10.3	-19 19.6	23 21.5	- 4 30.6	-0.3270	0.5769	+0.0544	+ 2	-57
σ Capricorni	5½	1.40	10.7	19 28.0	19 11 32.9	+ 7 14.6	+0.5930	0.5692	0.0774	+60	- 3
π Capricorni	5	1.42	11.0	18 34.7	14 36.8	+10 12.0	-0.0650	0.5671	0.0826	+19	-40
ρ Capricorni	5½	1.43	11.3	18 10.9	15 18.1	+10 41.8	-0.4254	0.5663	0.0835	0	-64
ο Capricorni	6	1.43	11.1	18 57.1	15 44.7	+11 17.5	+0.4236	0.5657	0.0845	+49	-13
υ Capricorni	5½	+1.49	+11.3	-18 32.0	20 16.5	- 8 20.1	+0.3845	0.5631	+0.0921	+47	-14
19 Capricorni	6	1.55	11.6	18 20.9	20 2 55.8	- 1 54.6	+0.8405	0.5591	0.1028	+72	+13
B. A. C. 7263	6	1.56	12.2	16 27.8	4 15.9	- 0 37.1	-1.0270	0.5578	0.1048	-35	-90
21 Capricorni	6½	1.58	11.7	17 58.0	5 42.2	+ 0 46.2	+0.7266	0.5572	0.1072	+72	+ 5
θ Capricorni	4	1.60	11.9	17 40.7	8 2.0	+ 3 1.2	+0.6733	0.5551	0.1105	+70	+ 2
29 Capricorni	5½	+1.63	+12.0	-15 38.3	12 36.0	+ 7 26.2	-0.9858	0.5524	+0.1171	-31	-90
ι Capricorni	4½	1.68	12.1	17 18.7	15 36.6	+10 20.7	+1.1640	0.5505	0.1212	+73	+39
42 Capricorni	5½	1.76	13.2	14 32.8	21 0 47.8	- 4 45.9	-0.6356	0.5446	0.1330	- 6	-83
44 Capricorni	6	1.77	13.0	14 54.8	1 30.9	- 4 4.2	-0.1436	0.5440	0.1342	+21	-45
45 Capricorni	6½	1.77	12.9	15 15.8	1 57.9	- 3 38.0	+0.2944	0.5436	0.1345	+45	-19
μ Capricorni	5	+1.81	+13.2	-14 4.8	6 26.0	+ 0 41.5	-0.3699	0.5396	+0.1397	+ 9	-59
ι Aquarii	4½	+1.87	+13.3	-14 24.8	12 51.5	+ 6 54.9	+0.9133	0.5367	+0.1468	+76	+17

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
ϵ^3 Aquarii	5½	+1.89	+14.1	-12 7.0	21 14 56.9	+ 8 56.3	-1.2680	0.5350	+0.1500	-54	-90
42 Aquarii	6	1.92	13.7	13 23.4	17 59.6	+11 53.4	+0.5714	0.5335	0.1520	+67	- 5
45 Aquarii	6½	1.93	13.5	13 52.0	19 5.1	-11 3.2	+1.2570	0.5335	0.1531	+76	+48
σ Aquarii	5	1.98	14.4	11 15.2	22 0 56.3	- 5 22.8	-0.6720	0.5292	0.1581	- 5	-86
58 Aquarii	6½	2.00	14.3	11 28.8	1 27.6	- 4 52.4	-0.3424	0.5288	0.1585	+14	-57
70 Aquarii	6	+2.07	+14.3	-11 9.0	10 0.3	+ 3 24.8	+0.6849	0.5261	+0.1658	+80	+ 2
Lalande 44734	6½	2.09	14.5	10 30.4	12 10.2	+ 5 30.9	+0.5054	0.5253	0.1676	+63	- 9
h^1 Aquarii	5½	2.16	15.1	8 17.9	18 36.2	+11 45.4	-0.9854	0.5225	0.1719	-23	-90
χ Aquarii	5½	2.22	14.9	8 20.4	23 0 42.4	- 6 19.0	+0.1172	0.5201	0.1757	+41	-29
27 Piscium	5	2.43	15.4	4 10.7	22 54.1	- 8 45.6	-0.4494	0.5144	0.1855	+11	-64
29 Piscium	5	+2.44	+15.5	- 3 39.1	24 0 35.4	- 7 7.1	-0.7183	0.5140	+0.1860	- 4	-90
4 Ceti	6	2.47	15.5	3 10.3	3 45.9	- 4 2.0	-0.6587	0.5140	0.1871	0	-83
5 Ceti	6	2.47	15.5	3 4.4	4 1.1	- 3 47.3	-0.7196	0.5140	0.1871	- 4	-90
B. A. C. 5	5½	2.48	15.5	2 50.9	4 17.7	- 3 31.1	-0.9170	0.5140	0.1871	-16	-90
14 Ceti	6	2.63	15.1	1 7.3	18 46.3	+10 33.0	-0.0998	0.5124	0.1897	+30	-42
15 Ceti	6½	+2.65	+15.0	- 1 7.3	20 9.1	+11 53.4	+0.1590	0.5123	+0.1897	+45	-27
26 Ceti	6	2.77	14.5	+ 0 45.8	25 10 4.4	+ 1 25.3	+0.7117	0.5122	0.1895	+90	+ 3
29 Ceti	6½	2.80	14.5	1 24.4	12 20.0	+ 3 37.1	+0.4271	0.5121	0.1893	+63	-13
33 Ceti	6	2.81	14.5	1 50.9	13 43.7	+ 4 58.5	+0.1996	0.5122	0.1891	+48	-25
35 Ceti	6½	2.82	14.4	1 52.7	14 47.6	+ 6 0.6	+0.3697	0.5124	0.1890	+58	-16
f Piscium	5	+2.86	+14.4	+ 3 1.3	17 38.4	+ 8 46.6	-0.3623	0.5128	+0.1886	+16	-57
ν Piscium	4½	2.99	13.5	4 55.1	26 6 20.4	- 2 52.9	-0.0887	0.5150	0.1857	+31	-40
64 Ceti	5½	3.15	12.4	8 2.6	22 14.8	-11 25.7	-0.6495	0.5186	0.1791	+ 1	-80
ξ^1 Ceti	4½	3.16	12.3	8 19.2	23 6.5	-10 35.5	-0.8007	0.5188	0.1784	- 8	-82
ξ^2 Ceti	4½	3.21	11.3	7 57.4	27 7 4.7	- 2 51.2	+1.0060	0.5220	0.1740	+90	+24
B. A. C. 830	6	+3.30	+10.6	+10 15.7	14 30.2	+ 4 21.3	-0.2726	0.5243	+0.1689	+21	-49
μ Ceti	4½	3.30	10.3	9 38.4	15 46.1	+ 5 35.0	+0.6281	0.5248	0.1680	+81	+ 1
Lalande 5725	6	3.41	9.0	12 45.4	28 2 44.7	- 7 45.9	-1.0150	0.5292	0.1594	-23	-77
f Tauri	4	3.47	7.1	12 33.0	15 5.4	+ 4 12.4	+1.1050	0.5341	0.1473	+90	+36
48 Tauri	6	3.59	3.6	15 7.3	29 13 2.6	+ 1 28.4	+1.2370	0.5444	0.1212	+90	+55
γ Tauri	4	+3.61	+ 3.3	+15 21.3	14 58.2	+ 3 20.3	+1.2120	0.5455	+0.1186	+90	+52
δ^1 Tauri	4	3.65	3.0	17 16.8	16 26.2	+ 4 45.5	-0.7194	0.5466	0.1164	- 5	-73
63 Tauri	6	3.63	3.0	16 30.8	16 40.9	+ 4 59.7	+0.1457	0.5466	0.1162	+45	-19
δ^2 Tauri	5½	3.64	2.9	17 10.9	16 59.5	+ 5 17.7	-0.5483	0.5466	0.1159	+ 6	-60
δ^3 Tauri	5	3.66	2.9	17 40.1	17 38.7	+ 5 55.6	-1.0060	0.5469	0.1150	-24	-72
70 Tauri	6½	+3.62	+ 2.7	+15 40.9	17 45.1	+ 6 1.8	+1.1790	0.5471	+0.1147	+90	+49
75 Tauri	6½	3.63	2.5	16 6.4	19 5.6	+ 7 19.7	+0.8656	0.5471	0.1127	+90	+23
B. A. C. 1391	5	3.63	2.3	15 56.8	20 6.1	+ 8 18.3	+1.1540	0.5475	0.1114	+90	+46
α Tauri	1	3.64	1.8	16 16.9	22 38.5	+10 45.8	+1.0655	0.5491	0.1076	+90	+38
B. A. C. 1468	6½	3.69	0.9	18 31.7	30 3 28.8	- 8 33.3	-0.8784	0.5512	0.1002	-16	-71
i Tauri	6½	+3.70	+ 0.5	+18 38.8	5 52.0	- 6 14.8	-0.7732	0.5526	+0.0969	- 8	-71
m Tauri	5½	+3.68	- 1.0	+18 29.6	13 19.5	+ 0 57.9	+0.0741	0.5549	+0.0851	+41	-19

DECEMBER.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
119 Tauri	5	+3.66	- 3.2	+18 30.4	1 0 43.6	+11 59.1	+0.9154	0.5595	+0.0656	+90	+31
120 Tauri	6	3.66	3.4	18 27.4	1 19.4	-11 26.3	+1.0090	0.5595	0.0649	+90	+37
127 Tauri	6½	3.65	4.2	18 55.3	5 33.9	- 7 20.5	+0.7643	0.5610	0.0568	+90	+22
χ^1 Orionis	4½	3.67	5.3	20 15.2	10 43.9	- 2 21.1	-0.4047	0.5636	0.0476	+13	-43
χ^2 Orionis	6	3.66	5.3	19 43.5	10 59.1	- 2 6.5	+0.1799	0.5639	0.0473	+47	- 9
χ^3 Orionis	6	+3.63	- 6.1	+19 41.4	14 48.2	+ 1 34.8	+0.3842	0.5649	+0.0401	+61	+ 2
χ^4 Orionis	5	3.64	6.1	20 8.3	15 0.2	+ 1 46.4	-0.0916	0.5649	0.0399	+31	-25
68 Orionis	6	3.63	6.8	19 48.8	18 37.8	+ 5 16.5	+0.3889	0.5656	0.0327	+61	+ 3
71 Orionis	6	3.61	7.0	19 11.5	19 54.7	+ 6 30.7	+1.0990	0.5662	0.0307	+90	+49
15 Geminorum	6½	3.61	8.2	20 51.4	2 1 37.0	-11 58.8	-0.5475	0.5678	0.0197	+ 5	-51
16 Geminorum	6½	+3.60	- 8.2	+20 33.7	1 41.8	-11 54.2	-0.2308	0.5678	+0.0193	+23	-30
ν Geminorum	4½	+3.59	- 8.3	+20 16.9	2 9.0	-11 28.0	+0.0787	0.5678	+0.0190	+41	-12

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
ζ Geminor. *var.*	4	+3.49	-11.1	+20 43.9	2 17 38.0	+ 3 28.3	-0.3481	0.5696	-0.0119	+16	-36
56 Geminorum	5½	3.42	12.3	20 39.2	3 1 27.4	+11 1.2	-0.4167	0.5710	0.0274	+13	-42
61 Geminorum	6	3.39	12.5	20 28.7	3 38.2	-10 52.7	-0.2943	0.5714	0.0318	+20	-35
79 Geminorum	6½	3.30	13.8	20 35.0	11 35.7	- 3 12.0	-0.7191	0.5716	0.0471	- 5	-70
g Geminorum	5½	3.26	13.4	18 46.9	12 3.4	- 2 45.4	+1.1690	0.5716	0.0481	+90	+54
85 Geminorum	6	+3.23	-14.2	+20 10.6	16 11.7	+ 1 14.1	-0.5256	0,5712	-0.0560	+ 7	-53
*d*¹ Cancri	6	3.08	15.5	18 41.4	4 4 19.6	-11 3.8	+0.2228	0.5705	0.0789	+50	-10
θ Caneri	5½	3.03	15.9	18 28.2	7 56.0	- 7 35.2	+0.1577	0.5702	0.0857	+46	-14
SATURN				19 6.2	12 13.1	- 3 27.1	-0.8931	0.5714	0.0939	-16	-71
δ Cancri	4	2.94	16.4	18 33.8	13 40.0	- 2 3.3	-0.4641	0.5702	0.0965	+10	-52
7 Leonis	6½	+2.63	-17.0	+14 52.7	5 12 17.2	- 4 13.7	+0.7643	0.5665	-0.1338	+90	+14
ψ Leonis	6	2.57	17.0	14 31.9	15 46.2	- 0 52.1	+0.6469	0.5656	0.1394	+84	+ 6
23 Leonis	6½	2.52	16.9	13 35.3	19 1.7	+ 2 16.6	+1.1640	0.5656	0 1446	+90	+42
α Leonis	1½	2.42	16.8	12 30.8	6 2 46.6	+ 9 45.3	+1.1100	0.5640	0.1553	+90	+36
34 Leonis	6½	2.40	17.2	13 54.4	4 12.4	+11 8.1	-0.5542	0.5631	0.1570	+ 6	-66
l Leonis	5½	+2.15	-16.3	+11 8.3	21 6.4	+ 3 27.2	-0.5359	0.5618	-0.1775	+ 7	-65
B. A. C. 3837	6½	2.00	15.2	8 40.4	7 8 17.0	- 9 45.3	-0.0545	0.5606	0.1884	+33	-37
b Virginis	6	1.77	12.9	4 16.8	8 5 1.8	+10 16.9	+0.3394	0.5605	0.2030	+56	-17
10 Virginis	6½	1.73	12.1	2 31.8	9 25.0	- 9 28.8	+1.2160	0.5610	0.2051	+90	+40
c Virginis	5½	1.66	12.3	+ 3 56.3	14 14.3	- 4 49.4	-1.2010	0.5610	0.2069	-38	-86
65 Virginis	6	+1.43	- 7.3	- 4 20.1	9 18 16.1	- 1 45.9	+1.2580	0.5666	-0.2086	+86	+45
80 Virginis	6	1.37	6.7	4 49.3	23 37.7	+ 3 24.5	+0.6284	0.5686	0.2070	+80	- 2
88 Virginis	6½	1.33	5.8	6 16.5	10 5 12.2	+ 8 47.0	+0.9333	0.5709	0.2050	+84	+16
ξ¹ Libræ	6	1.18	1.4	11 26.2	11 9 25.1	+11 58.8	+0.5680	0.5818	0.1826	+70	- 5
ξ² Libræ	5½	1.16	1.5	10 57.2	10 25.6	-11 2.9	-0.0947	0.5825	0.1814	+27	-42
17 Libræ	7	+1.15	- 1.5	-10 41.9	11 3.0	-10 26.9	-0.4617	0·5828	-0.1807	+ 7	-66
18 Libræ	6½	1.15	1.4	10 41.4	11 19.3	-10 11.2	-0.5199	0.5828	0.1806	+ 4	-71
B. A. C. 5070	6	1.10	- 0.1	11 57.9	21 41.0	- 0 12.8	-1.0540	0.5871	0.1674	-32	-90
γ Libræ	4½	1.11	+ 0.9	14 24.7	12 2 26.2	+ 4 21.8	+0.6061	0.5891	0.1604	+70	- 3
η Libræ	6	1.09	1.3	15 18.8	5 55.6	+ 7 43.2	+0.9535	0.5902	-0.1551	+75	+20
				NEW	*MOON.*						
ξ¹ Sagittarii	5½	+1.05	+ 8.4	-20 48.1	15 10 52.7	+ 9 40.0	+0.3441	0.5948	+0.0053	+35	-17
ξ² Sagittarii	3½	1.06	8.3	21 15.1	11 1.5	+ 9 48.4	+0.8058	0.5948	0.0056	+69	+11
Lalande 35497	6½	1.05	8.6	19 24.3	13 12.8	+11 54.7	-1.0670	0.5947	0.0104	-47	-90
B. A. C. 6536	6	+1.05	+ 8.7	-19 27.9	15 19.3	-10 3.7	-0.9795	0.5942	+0.0149	-41	-90
π Sagittarii	3	1.07	8.6	21 12.0	15 53.4	- 9 30.9	+0.8085	0.5934	0.0164	+69	+11
B. A. C. 6707	6½	1.09	9.4	19 5.9	16 2 49.7	+ 1 0.4	-1.0420	0.5876	0.0401	-42	-90
f Sagittarii	5	1.12	9.5	20 1.7	6 55.6	+ 4 57.0	+0.0983	0.5860	0.0485	+24	-31
57 Sagittarii	6	1.13	9.7	19 19.6	9 21.9	+ 7 17.9	-0.5017	0.5838	0.0535	- 7	-71
σ Capricorni	5½	+1.19	+10.1	-19 28.0	20 50.7	- 5 38.7	+0.3872	0.5768	+0.0766	+45	-14
π Capricorni	5	1.21	10.2	18 34.7	17 0 15.8	- 2 21.0	-0.2683	0.5754	0.0824	+ 8	-53
ρ Capricorni	5½	1.22	10.4	18 10.9	0 56.1	- 1 42.2	-0.6272	0.5746	0.0836	-11	-83
ο Capricorni	6	1.22	10.3	18 57.2	1 22.1	- 1 17.1	+0.2160	0.5741	0.0841	+35	-24
υ Capricorni	5½	1.24	10.6	18 32.0	5 46.9	+ 2 58.3	+0.1679	0.5716	0.0926	+32	-27
19 Capricorni	6	+1.29	+10.7	-18 20.9	12 16.3	+ 9 14.0	+0.6088	0.5670	+0.1032	+64	- 2
21 Capricorni	6½	1.31	10.8	17 58.0	14 58.2	+11 50.2	+0.4921	0.5650	0.1075	+57	- 9
θ Capricorni	4	1.33	10.9	17 40.7	17 14.7	- 9 58.0	+0.4377	0.5627	0 1109	+52	-12
29 Capricorni	5½	1.37	11.5	15 38.3	21 41.7	- 5 40.2	-1.2100	0.5602	0.1179	-52	-90
ι Capricorni	4½	1.38	11.1	17 18.7	18 0 37.7	- 2 50.2	+0.9154	0.5581	0.1221	+73	+17
42 Capricorni	5½	+1.45	+11.8	-14 32.8	9 35.0	+ 5 49.2	-0.8776	0.5520	+0.1343	-22	-90
44 Capricorni	6	1.46	11.7	14 54.8	10 17.0	+ 6 29.7	-0.3908	0.5513	0.1350	+ 7	-61
45 Capricorni	6½	1.46	11.7	15 15.8	10 43.4	+ 6 55.3	+0.0409	0.5509	0.1353	+31	-34
μ Capricorni	5	1.50	11.8	14 4.8	15 5.1	+11 8.4	-0.6186	0.5484	0.1412	- 5	-81
ι Aquarii	4½	1.55	11.8	14 24.8	21 21.4	- 6 47.4	+0.6460	0.5444	0.1482	+72	0
42 Aquarii	6	+1.60	+12.0	-13 23.4	19 2 22.4	- 1 56.0	+0.3029	0.5407	+0.1533	+49	-19
45 Aquarii	6½	+1.61	+11.9	-13 52.0	3 26.4	- 0 54.0	+0.9822	0.5395	+0.1544	+76	+21

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0.		Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
σ Aquarii	5	+1.65	+12.7	-11 15.2	19 9 10.2	+ 4 39.0	-0.9317	0.5362	+0.1600	-21	-90
58 Aquarii	6½	1.66	12.6	11 28.8	9 40.6	+ 5 8.5	-0.6080	0.5359	0.1603	- 1	-79
70 Aquarii	6	1.74	12.5	11 9.0	18 3.2	-10 44.5	+0.4087	0.5316	0.1677	+57	-14
Lalande 44734	6½	1.76	12.7	10 39.4	20 10.6	- 8 40.9	+0.2314	0.5302	0.1689	+46	-23
ψ^1 Aquarii	4	1 87	12.6	9 42.0	20 7 58.6	+ 2 45.7	+1.2370	0.5242	0.1769	+80	+43
χ Aquarii	5½	+1.90	+13.0	- 8 20.4	8 30.1	+ 3 16.3	-0.1563	0.5237	+0.1771	+25	-45
27 Piscium	5	2.13	13.4	4 10.8	21 6 25.8	+ 0 33.8	-0.7143	0.5162	0.1866	- 4	-90
29 Piscium	5	2.15	13.5	3 39.2	8 6.0	+ 2 11.1	-0.9817	0.5153	0.1871	-21	-90
4 Ceti	6	2.19	13.5	3 10.4	11 15.0	+ 5 14.8	-0.9212	0.5152	0.1881	-16	-90
5 Ceti	6	2.19	13.5	3 4.5	11 30.0	+ 5 29.3	-0.9835	0.5148	0.1881	-21	-90
B. A. C. 5	5½	+2.19	+13.6	- 2 51.0	11 46.4	+ 5 45.3	-1.1790	0.5148	+0.1881	-36	-90
14 Ceti	6	2.36	13.3	1 7.4	22 2 10.2	- 4 15.4	-0.3574	0.5125	0.1904	+17	-58
15 Ceti	6½	2.37	13.2	- 1 7.4	3 32.5	- 2 55.4	-0.0958	0.5122	0.1906	+31	-42
26 Ceti	6	2.50	12.7	+ 0 45.8	17 26.5	+10 35.1	+0.4642	0.5105	0.1899	+65	-11
29 Ceti	6½	2.53	12.7	1 24.4	19 41.8	-11 13.4	+0.1827	0.5113	0.1899	+47	-26
33 Ceti	6	+2.55	+12.7	+ 1 50.9	21 5.6	- 9 51.9	-0.0406	0.5113	+0.1899	+34	-38
35 Ceti	6½	2.56	12.6	1 52.7	22 9.6	- 8 49.7	+0.1291	0.5113	0.1897	+44	-28
f Piscium	5	2.65	12.7	3 1.3	23 1 0.1	- 6 4.1	-0.5997	0.5115	0.1892	+ 3	-78
ν Piscium	4½	2.80	12.1	4 55.1	13 44.0	+ 6 18.3	-0.3082	0.5131	0.1860	+19	-54
64 Ceti	5½	2.99	11.1	8 2.6	24 5 42.0	- 2 10.8	-0.8470	0.5168	0.1796	-11	-82
ξ^1 Ceti	4½	+3.02	+11.1	+ 8 19.2	6 33.8	- 1 20.4	-0.9982	0.5170	+0.1792	-21	-82
ξ^2 Ceti	4½	3.99	10.0	7 57.4	14 34.1	+ 6 26.0	+0.8196	0.5189	0.1744	+90	+12
B. A. C. 830	6	3.21	9.6	10 15.7	22 1.7	-10 19.5	-0.4421	0.5222	0.1698	+12	-60
μ Ceti	4½	3.21	9.3	9 38.4	23 18.0	- 9 5.3	+0.4596	0.5222	0.1688	+66	- 8
Lalande 5725	6	3.37	8.4	12 45.3	25 10 19.5	+ 1 36.5	-1.1580	0.5262	0.1602	-36	-77
f Tauri	4	+3.48	+ 6.4	+12 33.0	22 42.4	-10 22.9	+0.9800	0.5328	+0.1488	+90	+25
48 Tauri	6	3.72	3.0	15 7.3	26 20 40.3	+10 53.8	+1.1510	0.5445	0.1229	+90	+45
γ Tauri	4	3.74	2.7	15 21.2	22 35.9	-11 14.3	+1.1310	0.5448	0.1201	+90	+42
δ^1 Tauri	4	3.79	2.6	17 16.7	27 0 3.7	- 9 49.3	-0.7912	0.5457	0.1183	- 9	-73
63 Tauri	6	3.78	2.4	16 30.7	0 18.5	- 9 34.9	+0.0726	0.5459	0.1182	+40	-23
δ^2 Tauri	5½	+3.79	+ 2.5	+17 10.9	0 37.0	- 9 17.1	-0.6208	0.5459	+0.1177	+ 1	-67
δ^3 Tauri	5	3.81	2.5	17 40.1	1 16.2	- 8 39.2	-1.0740	0.5464	0.1167	-30	-72
70 Tauri	6½	3.76	2.1	15 40.9	1 22.5	- 8 33.1	+1.1020	0.5464	0.1167	+90	+39
75 Tauri	6½	3.78	1.9	16 6.4	2 42.8	- 7 15.3	+0.7930	0.5475	0.1149	+90	+18
θ^1 Tauri	4	3.77	1.8	15 42.6	2 46.8	- 7 11.4	+1.2340	0.5475	0.1147	+90	+55
B. A. C. 1391	5	+3.78	+ 1.7	+15 56.8	3 43.0	- 6 17.0	+1.0810	0.5475	+0.1132	+90	+38
α Tauri	1	3.81	1.3	16 16.9	6 15.0	- 3 49.9	+0.9982	0.5490	0.1098	+90	+32
B. A. C. 1468	6½	3.89	0.6	18 31.7	11 4.2	+ 0 49.7	-0.9294	0.5516	0.1026	-19	-71
i Tauri	5½	3.92	+ 0.2	18 38.8	13 26.7	+ 3 7.5	-0.8191	0.5535	0.0989	-11	-71
B. A. C. 1526	5½	3.88	- 0.6	16 58.5	16 16.2	+ 5 51.5	+1.2660	0.5546	0.0944	+90	+62
m Tauri	5½	+3.94	- 1.4	+18 29.6	20 51.4	+10 17.5	+0.0396	0.5572	+0.0870	+39	-22
119 Tauri	5	3.98	3.6	18 30.4	28 8 9.9	- 2 47.0	+0.8980	0.5622	0.0679	+90	+29
120 Tauri	6	3.98	3.8	18 27.4	8 45.4	- 2 12.6	+0.9913	0.5624	0.0665	+90	+36
127 Tauri	6½	3.99	4.6	18 55.3	12 57.3	+ 1 50.7	+0.7551	0.5644	0.0592	+90	+22
χ^1 Orionis	4½	4.04	5.6	20 15.2	18 3.7	+ 6 46.4	-0.3947	0.5663	0.0500	+14	-43
χ^2 Orionis	6	+4.02	- 5.6	+19 43.5	18 18.8	+ 7 1.0	+0.1840	0.5666	+0.0494	+48	- 9
χ^3 Orionis	6	4.04	6.6	19 41.4	22 5.0	+10 39.2	+0.3922	0.5680	0.0423	+62	+ 3
χ^4 Orionis	5	4.05	6.6	20 8.3	22 16.8	+10 50.6	-0.0784	0.5680	0.0421	+32	-23
68 Orionis	6	4.04	7.4	19 48.8	29 1 51.7	- 9 41.9	+0.4082	0.5702	0.0351	+63	+ 4
71 Orionis	6	4.03	7.8	19 11.5	3 7.5	- 8 28.9	+1.1120	0.5702	0.0325	+90	+50
15 Geminorum	6½	+4.07	- 8.9	+20 51.4	8 44.8	- 3 3.4	-0.5098	0.5720	+0.0216	+ 7	-50
16 Geminorum	6½	4.06	8.9	20 33.7	8 49.6	- 2 58.8	-0.1936	0.5720	0.0215	+25	-28
ν Geminorum	4½	4.06	9.0	20 16.9	9 16.6	- 2 32.8	+0.1137	0.5723	+0.0208	+43	-11
ζ Geminor. *var.*	4	4.04	12.1	20 43.9	30 0 30.1	-11 52.0	-0.2863	0.5767	-0.0104	+20	-33
56 Geminorum	5½	4.00	13.6	20 39.2	8 10.7	- 4 28.0	-0.3398	0.5781	0.0257	+17	-37
61 Geminorum	6	+3.99	-14.0	+20 28.7	10 19.2	- 2 24.2	-0.2163	0.5773	-0.0301	+24	-30
79 Geminorum	6½	+3.95	-15.5	+20 34.9	18 7.5	+ 5 7.2	-0.6217	0.5773	-0.0460	+ 1	-60

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1887.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
g Geminorum	5½	+3.90	−15.4	+18 46.8	**30** 18 34.7	+ 5 33.4	+1.2520	0.5773	−0.0471	+90	+65
85 Geminorum	6	3.90	16.3	20 10.5	22 38.1	+ 9 28.0	−0.4221	0.5773	0.0552	+12	−45
d^1 Cancri	6	3.79	18.0	18 41.4	**31** 10 31.7	− 3 4.2	+0.3362	0.5773	0.0789	+57	− 4
θ Cancri	5½	3.75	18.5	18 28.2	14 3.8	+ 0 20.1	+0.2748	0.5768	0.0855	+53	− 9
SATURN				19 30.9	15 45.4	+ 1 58.0	−0.9636	0.5798	0.0889	−22	−70
δ Cancri	4	+3.71	−19.2	+18 33.8	19 41.0	+ 5 45.2	−0.3333	0.5758	−0.0958	+17	−43

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1887.

Date.	The Star's		IMMERSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle from		Washington.		Angle from		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
Jan. 2	*f* Piscium	5	2 1	7 12	58	42	3 28	8 38	248	212	1 26
6	α Tauri	1	0 23	5 18	31	85	1 15	6 10	293	344	0 52
6	B. A. C. 1526 *	5½	11 57	16 51	74	25	12 45	17 39	281	236	0 48
9	*f* Geminorum	6	3 55	8 38	180	234	Star 0′.2	south of	☽'s	limb.	
10	54 Cancri	6½	9 12	13 50	128	113	10 24	15 2	266	228	1 12
14	γ Virginis *mult.*	2½	10 9	14 31	138	174	11 21	15 43	278	299	1 12
	NEW MOON.										
31	μ Ceti *	4½	9 42	12 58	113	63	10 26	13 41	225	178	0 43
Feb. 1	*f* Tauri	4	8 36	11 48	170	117	Star 4′.3	south of	☽'s	limb.	
2	48 Tauri	6	3 41	6 49	115	129	4 48	7 56	213	196	1 7
2	γ Tauri	4	6 31	9 39	122	77	7 30	10 38	219	168	0 59
2	70 Tauri	6½	9 40	12 48	88	35	10 39	13 47	262	210	0 59
2	θ^1 Tauri ‡	4	11 0	14 8	94	44	11 52	14 59	257	210	0 52
2	θ^2 Tauri ‡	4	11 5	14 13	117	67	11 50	14 58	234	187	0 45
8	45 Leonis	6	13 12	15 55	42	357	13 32	16 16	4	316	0 21
8	ρ Leonis	4	15 50	18 33	20	328	Star 2′.4	north of	☽'s	limb.	
11	65 Virginis	6	15 8	17 40	68	41	15 58	18 30	341	304	0 50
11	66 Virginis	6	15 50	18 22	92	57	16 55	19 27	312	269	1 5
	NEW MOON.										
Mar. 1	α Tauri	1	22 7	23 27	345	36	Star 10′.2	north of	☽'s	limb.	
2	B. A. C. 1526	5½	9 59	11 17	79	25	10 58	12 16	277	329	0 59
5	*f* Geminorum	6	5 15	6 22	182	230	Star 2′.0	south of	☽'s	limb.	
6	54 Cancri	6½	11 12	12 13	107	60	12 19	13 21	289	236	1 8
10	γ Virginis *mult*	2½	7 52	8 38	182	231	8 13	8 59	222	271	0 21
11	88 Virginis	6½	12 10	12 52	71	94	13 4	13 45	343	353	0 53
11	B. A. C. 4647	6½	16 46	17 27	161	123	17 29	18 10	240	196	0 43
	NEW MOON.										
29	α Tauri	1	8 4	7 36	98	45	9 12	8 43	252	198	1 8
Apr. 4	45 Leonis	6	15 12	14 19	21	229	Star 0′.9	north of	☽'s	limb.	
6	10 Virginis	6½	7 11	6 11	39	89	7 29	6 29	3	52	0 18
7	65 Virginis	6	16 19	15 14	23	344	Star 2′.1	north of	☽'s	limb.	
7	66 Virginis	6	16 42	15 37	59	17	17 23	16 18	344	298	0 41
16	42 Capricorni †	5½	15 30	13 49	57	109	16 29	14 48	285	335	0 59
17	σ Aquarii †	5	16 54	15 9	22	73	17 32	15 48	311	0	0 39
	NEW MOON.										
30	o^1 Cancri	5½	9 5	6 30	166	160	9 48	7 14	230	204	0 44
30	o^2 Cancri	6	8 45	6 11	99	102	10 7	7 32	296	328	1 22
May 4	γ Virginis *mult.*	2½	8 58	6 8	204	249	Star 2′.0	south of	☽'s	limb.	
4	46 Virginis *	6	18 55	16 4	127	76	19 44	16 52	268	217	0 49
5	88 Virginis	6½	14 8	11 13	27	20	Star 4′.1	north of	☽'s	limb.	
5	B. A. C. 4647	6½	17 57	15 2	138	92	18 50	15 54	258	209	0 52
7	γ Libræ *	4½	9 26	6 24	158	210	10 2	6 59	240	291	0 35
7	η Libræ	6	14 8	11 6	202	223	Star 1′.9	south of	☽'s	limb.	
8	24 Scorpii	5½	12 29	9 22	53	97	13 7	10 0	343	23	0 38
10	29 Sagittarii	5½	18 54	15 39	93	90	20 19	17 4	258	237	1 25

NOTE.—The angles of position are counted from the north point and vertex of the moon's limb, toward the east.
* Whole occultation below the horizon of Washington.
† Immersion below the horizon of Washington.
‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1887.

Date.	The Star's		Immersion.				Emersion.				Duration of Occultation.
			Washington.		Angle from		Washington.		Angle from		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
	NEW MOON.										
May 22	α Tauri †	1	21 9	17 6	60	107	22 0	17 57	270	321	0 51
June 1	65 Virginis	6	12 53	8 12	128	135	14 11	9 30	289	274	1 18
1	66 Virginis	6	13 50	9 9	142	134	15 0	10 19	272	246	1 10
6	16 Sagittarii	6½	14 43	9 42	114	153	15 56	10 55	264	292	1 13
6	21 Sagittarii	5	20 49	15 48	117	86	21 51	16 50	234	194	1 2
18	48 Tauri †	6	21 15	15 25	98	148	22 5	16 15	229	281	0 50
19	α Tauri	1	9 30	3 39	156	102	9 51	4 0	194	141	0 21
	NEW MOON.										
24	α Leonis	1½	4 23	22 8	93	145	5 23	23 9	292	345	1 0
26	σ Leonis	4	14 49	8 30	97	50	15 50	9 30	310	259	1 1
July 1	49 Libræ	6	18 37	11 57	164	131	19 11	12 32	220	182	0 34
2	29 Ophiuchi	6½	20 28	13 44	98	64	21 34	14 50	269	223	1 6
4	29 Sagittarii	5½	15 47	8 56	68	102	16 59	10 8	302	324	1 12
4	ξ^1 Sagittarii	5½	21 3	14 11	165	137	21 13	14 21	181	151	0 10
5	*f* Sagittarii	5	16 2	9 6	106	146	17 17	10 22	253	283	1 16
6	υ Capricorni	5½	16 0	9 0	136	183	16 45	9 46	215	257	0 45
9	χ Aquarii	5½	21 58	14 46	28	46	23 14	16 2	276	276	1 16
	NEW MOON.										
22	α Leonis	1½	16 5	8 3	19	327	Star 7′.4	north of	☽'s	limb.	
23	χ Leonis	4½	16 3	7 57	108	56	16 57	8 51	294	243	0 54
26	88 Virginis	6½	15 31	7 14	114	87	16 45	8 27	293	254	1 14
29	24 Scorpii	5½	20 15	11 46	6	325	Star 3′.4	north of	☽'s	limb.	
Aug. 2	π Capricorni	5	21 33	12 47	27	11	22 29	13 43	390	273	0 56
5	Lalande 44734	6½	17 45	8 47	92	141	18 52	9 54	234	277	1 7
11	*f* Tauri †	4	20 28	11 6	49	99	21 19	11 58	274	326	0 52
12	γ Tauri *	4	20 21	10 56	48	93	21 7	11 41	282	330	0 46
12	70 Tauri	6½	22 52	13 27	63	116	23 56	14 30	260	314	1 3
12	θ^1 Tauri	4	0 27	15 1	112	165	1 21	15 55	208	259	0 54
12	75 Tauri	6½	0 48	15 22	14	67	1 30	16 4	306	356	0 42
12	θ^2 Tauri	4	0 52	15 26	160	212	Star 0′.5	south of	☽'s	limb.	
12	B. A. C. 1391	5	1 37	16 11	96	146	2 49	17 23	224	262	1 12
14	71 Orionis	6	0 6	14 32	26	79	0 39	15 5	315	9	0 33
16	ζ^1 Cancri †	4½	0 45	15 3	88	135	1 36	15 54	274	325	0 51
	NEW MOON.										
27	16 Sagittarii	6½	18 13	7 49	96	95	19 40	9 17	266	246	1 27
Sept. 4	26 Ceti	6	2 19	15 23	151	129	Star 3′.5	south of	☽'s	limb.	
6	ξ^2 Ceti	4½	21 11	10 7	81	133	22 16	11 12	231	281	1 5
9	B. A. C. 1526	5½	23 31	12 15	109	163	0 24	13 8	217	271	0 53
12	*g* Geminorum	5½	1 39	14 11	80	133	2 38	15 10	277	332	0 59
	NEW MOON.										
21	49 Libræ	6	18 11	6 9	152	122	18 59	6 57	234	197	0 48
22	29 Ophiuchi	6½	19 44	7 38	82	49	20 54	8 48	287	244	1 10
24	ξ^1 Sagittarii	5½	20 39	8 25	125	102	21 38	9 24	220	187	0 59

Note.—The angles of position are counted from the north point and vertex of the moon's limb, toward the east.

* Whole occultation below the horizon of Washington.

† Immersion below the horizon of Washington.

‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1887.

Date.	The Star's		Immersion.				Emersion.				Duration of Occultation.
			Washington.		Angle from		Washington.		Angle from		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
Sept. 27	44 Capricorni	6	1 58	13 31	48	3	2 57	14 30	271	221	0 59
27	45 Capricorni	6½	2 39	14 12	160	111	Star 4′.1	south of	☽'s	limb	
29	χ Aquarii	5½	1 12	12 38	66	37	2 29	13 54	239	198	1 17
Oct. 6	α Tauri	1	21 43	8 41	82	132	22 38	9 36	245	298	0 55
7	119 Tauri	5	0 15	11 9	70	125	1 22	12 16	261	316	1 7
7	120 Tauri	6	0 55	11 49	100	155	1 59	12 53	232	286	1 4
11	π^2 Cancri	6	2 32	13 9	186	236	Star 3′.7	south of	☽'s	limb.	
	NEW MOON.										
18	γ Libræ	4½	19 48	5 59	36	351	20 14	6 25	347	300	0 26
23	ο Capricorni	6	22 4	7 56	72	50	23 24	9 16	253	218	1 20
28	14 Ceti	6	4 5	13 36	354	309	4 29	14 0	315	268	0 24
28	15 Ceti	6½	5 6	14 37	74	25	6 9	15 40	242	191	1 3
29	35 Ceti	6½	21 42	7 10	354	39	22 9	7 37	312	354	0 27
31	μ Ceti	4½	22 4	7 24	50	102	23 12	8 32	260	309	1 8
Nov. 1	*f* Tauri	4	21 40	6 55	160	212	Star 1′.3	south of	☽'s	limb.	
2	75 Tauri	6½	2 49	12 0	160	197	Star 3′.7	south of	☽'s	limb.	
4	68 Orionis	6	2 27	11 31	26	82	3 13	12 16	312	5	0 46
8	α Leonis	1½	12 55	21 42	147	99	13 52	22 38	260	208	0 57
	NEW MOON.										
18	π Sagittarii	3	21 56	6 6	131	97	22 41	6 50	210	170	0 45
20	21 Capricorni	6½	21 28	5 30	60	53	22 51	6 52	260	236	1 23
20	θ Capricorni	4	0 41	8 42	94	53	1 42	9 43	227	180	1 1
22	70 Aquarii	6	3 5	10 58	127	80	3 36	11 29	186	138	0 31
25	26 Ceti	6	2 32	10 13	118	91	3 18	10 59	185	148	0 46
25	29 Ceti	6½	5 33	13 14	86	37	6 35	14 16	232	181	1 2
25	33 Ceti *	6	7 14	14 54	42	351	8 3	15 44	281	231	0 50
27	ξ^2 Ceti	4½	21 35	5 9	108	160	22 25	5 59	202	251	0 50
27	μ Ceti *	4½	9 18	16 50	128	78	9 52	17 24	206	158	0 34
29	63 Tauri	6	10 45	18 9	354	303	Star 2′.1	north of	☽'s	limb.	
30	*m* Tauri	5	6 17	13 37	19	344	6 58	14 18	323	279	0 41
Dec. 1	χ^2 Orionis	6	2 40	9 57	347	41	Star 0′.4	north of	☽'s	limb.	
1	χ^3 Orionis	6	7 40	14 56	99	55	8 59	16 16	262	208	1 20
5	ψ Leonis	6	8 31	15 32	198	225	Star 0′.3	south of	☽'s	limb.	
	NEW MOON.										
27	α Tauri	1	23 6	4 41	162	215	Star 0′.2	south of	☽'s	limb.	
28	119 Tauri	5	1 15	6 46	165	220	Star 3′.6	south of	☽'s	limb.	
29	ν Geminorum	4½	2 50	8 17	350	45	Star 3′.6	north of	☽'s	limb.	
31	d^1 Cancri	6	3 26	8 45	82	137	4 33	9 52	284	339	1 7
31	θ Cancri	5½	8 13	13 32	86	93	9 32	14 51	303	272	1 19

NOTE. The angles of position are counted from the north point and vertex of the moon's limb, toward the east.
* Whole occultation below the horizon of Washington.
† Immersion below the horizon of Washington.
‡ Emersion below the horizon of Washington.

DOWNES'S TABLE GIVING VALUES OF τ.

FOR COMPUTING THE TIME AND HOUR-ANGLE OF APPARENT CONJUNCTION.

h		Lat. 72°			Lat. 66°			Lat. 60°			Lat .54°			Lat. 48°			Lat. 42°			Lat. 36°		
		x'			x'			x'			x'			x'			x'			x'		
		.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50
h	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	10	2	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	6	5	6	7
	20	3	3	4	4	5	5	5	6	7	6	7	9	8	9	11	9	10	12	11	12	14
	30	5	5	6	6	7	8	8	9	11	10	11	13	12	13	16	14	16	18	16	18	22
	40	6	7	8	8	9	11	11	12	14	13	15	17	16	18	21	18	21	24	21	24	29
	50	7	8	10	10	11	13	13	15	17	16	19	21	19	22	26	22	26	30	26	30	36
1	0	9	10	11	12	14	16	16	18	21	19	22	26	23	26	31	26	31	36	30	35	42
	10	10	12	13	14	16	18	18	21	24	22	26	30	26	30	36	31	35	42	35	40	48
	20	12	13	15	16	18	21	21	23	27	25	29	34	30	34	40	35	40	47	39	45	54
	30	13	15	17	18	20	23	23	26	30	28	32	37	33	38	45	39	44	52	43	50	59
	40	14	16	18	20	22	25	25	29	33	31	35	41	36	42	49	42	48	57	47	54	64
	50	16	18	20	21	24	28	27	31	36	34	38	44	39	45	53	45	52	61	51	58	68
2	0	17	19	22	23	26	30	29	33	39	36	41	47	42	48	56	48	55	65	54	62	72
	10	18	20	23	25	28	32	31	36	41	38	43	50	45	51	59	51	59	68	57	66	76
	20	19	22	24	26	30	34	33	38	43	40	46	53	47	54	62	54	62	71	60	69	80
	30	20	23	26	28	31	36	35	40	45	42	48	55	50	56	65	57	64	74	63	72	83
	40	21	24	27	29	33	37	37	42	47	44	50	58	52	59	68	59	67	77	65	74	86
	50	22	25	28	30	34	39	38	43	49	46	52	60	54	61	70	61	69	79	68	76	88
3	0	23	26	30	31	35	40	40	45	51	48	54	62	56	63	72	63	71	81	70	79	90
	10	24	27	31	33	36	42	41	46	53	49	56	63	57	65	74	65	73	83	72	81	92
	20	25	28	32	34	38	43	42	47	54	51	57	65	59	66	75	66	74	85	73	82	93
	30	26	29	33	35	39	44	43	49	55	52	58	66	60	67	77	68	76	86	74	83	95
	40	26	29	33	36	40	45	44	50	56	53	59	67	61	69	78	69	77	87	75	84	96
	50	27	30	34	36	41	46	45	51	57	54	60	68	62	70	79	70	78	88	76	85	96
4	0	28	31	35	37	41	47	46	52	58	55	61	69	63	70	79	71	79	89	77	86	97
	10	28	31	35	38	42	47	47	52	59	56	62	70	64	71	80	71	79	89	78	86	97
	20	29	32	36	38	42	48	47	53	59	56	62	70	64	71	80	72	80	89	78	87	97
	30	29	32	36	39	43	48	48	53	60	57	63	71	65	72	81	72	80	90	79	87	97
	40	29	33	37	39	43	49	48	53	60	57	63	71	65	72	81	72	80	89	79	87	97
	50	30	33	37	39	44	49	48	54	60	57	63	71	65	72	81	72	80	89	79	87	96
5	0	30	33	37	39	44	49	49	54	60	57	63	71	65	72	80	72	80	89	78	86	95
	10	30	33	37	40	44	49	49	54	60	57	63	71	65	72	80	72	79	88	78	86	95
	20	30	33	37	40	44	49	49	54	60	57	63	71	65	71	79	72	79	88	78	85	94
	30	30	33	37	40	44	49	49	54	60	57	63	70	64	71	79	71	78	87	77	85	93
	40	30	33	37	39	44	49	48	53	59	56	62	70	64	70	78	70	77	86	76	84	91
	50	30	33	37	39	43	48	48	53	59	56	61	69	63	70	77	70	77	85	75	83	90
6	0	30	33	37	39	43	48	48	52	58	55	61	68	63	69	76	69	76	84	74	82	89
	10	30	33	37	39	43	47	47	52	58	55	60	67	62	68	75	68	75	82	73	80	87
	20	29	32	36	38	42	47	47	51	57	54	60	66	61	67	74	67	73	81	72	79	85
	30	29	32	36	38	42	46	46	51	56	53	59	65	60	66	73	66	72	80	71	78	84
	40	29	32	35	37	41	46	45	50	55	53	58	64	59	65	71	65	71	78	70	76	82
	50	28	31	35	37	40	45	45	49	54	52	57	62	58	63	70	63	69	76	68	74	80
7	0	28	31	34	36	40	44	44	48	53	51	55	61	57	62	68	62	68	75	67	73	78
	10	27	30	34	35	39	43	43	47	52	50	54	60	56	61	67	61	66	73	65	71	76
	20	27	30	33	35	38	42	42	46	51	48	53	58	54	59	65	59	65	71	64	69	74
	30	26	29	32	34	37	41	41	45	49	47	52	57	53	58	63	58	63	69	62	67	71
	40	26	28	31	33	36	40	40	44	48	46	50	55	51	56	62	56	61	67			
	50	25	27	31	32	35	39	39	42	47	45	49	53	50	54	60	54	59	65			
8	0	24	27	30	31	34	38	38	41	45	43	47	52	48	52	58	53	57	63			
	10	24	26	29	30	33	37	36	40	44	42	46	50	47	51	56	52	55	60			
	20	23	25	28	29	32	35	35	38	42	40	44	48	45	49	54						
	30	22	24	27	28	31	34	34	37	41	39	42	46	43	47	52						
	40	21	23	26	27	30	33	33	35	39	37	41	44	41	45	49						
	50	20	22	25	26	28	31	31	34	37	36	39	42	40	43	47						
9	0	19	21	24	25	27	30	30	32	35	34	37	40									
	10	18	20	22	24	26	28	28	31	34	32	35	38									
	20	18	19	21	22	24	27	27	29	32	31	33	36									
	30	16	18	20	21	23	25	25	27	30	29	31	34									
	40	15	17	19	20	22	24	24	26	28	27	29	32									

(*Concluded at bottom of next page.*)

DOWNES'S TABLE GIVING VALUES OF τ.

FOR COMPUTING THE TIME AND HOUR-ANGLE OF APPARENT CONJUNCTION.

h	Lat. 30°			Lat. 24°			Lat. 18°			Lat. 12°			Lat. 6°			Lat. 0°		
	x'			x'			x'			x'			x'			x'		
	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50
h m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	6	7	8	7	7	9	7	8	9	7	8	10	7	8	10	8	9	11
20	12	14	16	13	14	18	14	16	19	14	16	20	14	17	21	15	18	21
30	17	20	24	19	22	27	20	24	29	21	25	30	21	25	31	22	26	32
40	23	27	32	25	29	36	26	32	39	28	33	40	28	34	41	29	34	42
50	28	33	40	31	36	44	32	39	48	35	40	50	35	42	51	35	42	52
1 0	33	39	47	36	42	52	38	46	56	40	47	59	41	49	60	41	49	61
10	38	45	54	41	48	59	44	52	63	46	54	67	47	56	68	47	56	69
20	43	50	60	46	54	65	49	58	70	52	60	74	53	62	75	53	63	76
30	48	55	66	51	60	71	54	64	76	57	66	79	58	68	81	59	69	82
40	52	60	71	56	65	77	59	69	82	62	72	84	63	73	87	64	74	88
50	56	64	76	60	69	82	64	74	87	66	77	89	68	78	92	68	79	93
2 0	59	68	80	64	73	86	68	78	91	70	81	95	72	83	97	72	83	98
10	62	72	84	67	77	90	71	81	95	74	85	99	75	87	101	76	87	102
20	65	75	87	70	81	94	74	85	99	77	88	103	78	90	105	79	91	106
30	68	78	90	73	84	97	77	88	102	80	91	106	81	93	108	82	94	109
40	71	81	93	76	87	100	80	91	105	83	94	109	84	96	111	85	97	112
50	74	83	96	78	89	102	82	93	107	85	96	111	87	98	113	87	99	114
3 0	76	85	98	80	91	104	84	95	109	87	98	113	89	100	115	89	101	116
10	77	87	99	82	92	106	86	97	111	89	100	114	91	102	116	91	103	117
20	79	89	101	84	94	107	88	99	112	91	102	115	92	104	118	93	104	118
30	80	90	102	85	95	108	89	100	113	92	103	116	94	105	119	94	105	119
40	81	91	103	86	96	109	90	101	114	93	104	117	95	106	119	95	106	120
50	82	92	104	87	97	110	91	101	114	94	104	118	95	106	120	96	107	120
4 0	83	92	104	88	98	110	92	102	114	94	105	118	96	107	120	97	107	120
10	84	93	104	88	98	110	92	102	114	95	105	118	96	107	120	97	107	120
20	84	93	104	89	98	110	92	102	114	95	105	117	96	107	119	97	107	120
30	84	93	104	89	98	110	92	102	114	95	105	117	96	107	119	97	107	119
40	84	93	104	89	98	109	92	102	113	95	104	116	96	106	118	97	107	119
50	84	93	103	88	97	108	92	101	113	94	104	115	96	106	117	96	106	118
5 0	84	92	102	88	97	108	91	101	112	94	103	114	95	105	116	96	105	117
10	83	92	102	88	96	107	91	100	110	93	102	113	95	104	115	95	104	115
20	83	91	101	87	95	106	90	99	109	92	101	112	94	103	114	94	103	114
30	82	90	100	86	94	104	89	98	108	92	100	111	93	102	112	93	102	113
40	81	89	98	85	93	103	88	97	106	91	99	109	92	100	110			
50	80	88	97	84	92	101	87	95	105	89	97	107						
6 0	79	87	95	83	91	100	86	94	103	88	96	105						
10	78	85	94	82	89	98	84	92	101									
20	77	84	92	80	88	96	82	91	99									
30	75	82	90	79	86	94												
40	74	81	88	77	84	92												
50	72	79	86															
7 0	71	77	84															

(Concluded from preceding page.)

h	Lat. 72°			Lat. 66°			Lat. 60°			*h*	Lat. 72°			Lat. 66°			Lat. 60°		
	x'			x'			x'				x'			x'			x'		
	.62	.56	.50	.62	.56	.50	.62	.56	.50		.62	.56	.50	.62	.56	.50	.62	.56	.50
h m	m	m	m	m	m	m	m	m	m	h m	m	m	m	m	m	m	m	m	m
9 50	14	16	18	18	20	22	22	24	26	11 0	7	8	8	9	10	11	10	11	12
10 0	13	15	16	17	19	21	20	22	24	10	6	6	7	7	8	9	9	9	10
10	12	14	15	16	17	19	19	21	22	20	5	5	6	6	6	7	7	8	8
20	11	12	14	15	16	17	17	19	20	30	3	4	4	4	5	5			
30	10	11	12	13	14	16	16	17	18	40	2	3	3	3	3	4			
40	9	10	11	12	13	14	14	15	16	50	1	1	1	1	2	2			
50	8	9	10	10	11	12	12	13	14	12 0	0	0	0	0	0	0			

FOR WASHINGTON MEAN NOON.

Date.	*k*	*i*	*θ*	*L*	Date.	*k*	*i*	*θ*	*L*
Jan. 1	0.820	50°.2	185°.7	33.8	July 0	0.421	99°.1	13°.3	32.6
6	0.872	42.0	180.9	29.7	5	0.337	109.1	16.6	29.8
11	0.909	35.1	175.6	27.1	10	0.248	120.2	20.4	25.9
16	0.938	28.9	169.7	25.8	15	0.161	132.7	24.9	20.0
21	0.960	23.0	163.0	25.6	20	0.080	147.0	32.6	11.8
26	0.978	17.0	154.2	26.6	25	0.034	158.8	53.9	5.6
31	0.991	10.7	139.6	28.8	30	0.018	166.6	130.9	7.1
Feb. 5	0.998	5.4	92.5	32.7	Aug. 4	0.064	150.6	170.6	10.9
10	0.993	9.3	11.9	38.8	9	0.176	130.4	182.1	27.2
15	0.968	20.7	350.4	47.5	14	0.340	108.7	188.7	46.1
20	0.904	36.2	341.7	58.5	19	0.537	85.8	194.4	62.2
25	0.780	55.9	336.6	68.3	24	0.732	62.4	200.3	69.9
Mar. 2	0.591	79.5	333.0	68.9	29	0.881	40.4	207.0	66.6
7	0.370	105.1	329.4	53.5	Sept. 3	0.966	21.4	216.3	56.7
12	0.172	131.7	324.4	30.5	8	0.996	7.2	245.1	46.1
17	0.043	156.0	312.2	8.5	13	0.996	7.6	354.4	38.0
22	0.006	171.3	227.1	1.1	18	0.979	16.8	14.9	32.4
27	0.049	154.5	167.1	8.5	23	0.957	24.0	20.4	28.9
Apr. 1	0.139	136.2	159.2	20.0	28	0.930	30.8	22.9	27.0
6	0.238	121.5	155.7	27.5	Oct. 3	0.899	37.1	23.7	26.3
11	0.330	109.9	153.6	30.6	8	0.863	43.5	23.7	26.7
16	0.426	99.1	152.3	32.8	13	0.820	50.0	23.2	28.3
21	0.499	90.1	151.5	33.0	18	0.768	57.6	22.1	31.1
26	0.573	81.6	151.1	34.0	23	0.693	67.3	20.9	35.0
May 1	0.647	72.9	151.2	35.8	28	0.596	78.9	19.5	40.1
6	0.724	63.4	152.1	39.0	Nov. 2	0.462	94.4	18.4	44.1
11	0.804	52.5	153.7	44.1	7	0.285	115.4	17.9	40.5
16	0.888	39.1	156.5	51.4	12	0.096	143.8	17.9	19.8
21	0.961	22.9	161.9	59.9	17	0.000	178.1	319.8	0.5
26	0.996	7.4	189.0	66.3	22	0.061	151.4	205.5	13.8
31	0.977	17.3	340.9	66.7	27	0.324	110.7	204.2	52.1
June 5	0.901	36.6	349.0	60.4	Dec. 2	0.537	85.7	202.2	56.9
10	0.799	53.3	355.7	52.0	7	0.692	67.4	199.5	49.5
15	0.693	67.2	0.7	44.6	12	0.796	53.7	196.0	40.9
20	0.596	78.9	5.5	39.2	17	0.864	43.2	191.9	34.3
25	0.506	89.3	9.6	35.4	22	0.910	34.9	187.1	29.7
30	0.421	99.1	13.3	32.6	27	0.942	27.9	181.5	26.8
					32	0.965	21.7	174.7	25.3

NOTATION.

k, the ratio of the illuminated portion of the apparent disk to the entire apparent disk considered as the superficies of a circle.

i, the angle between the sun and earth, as seen from the planet.

θ, the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L, the brilliancy of the disk. The unit of *L* is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the sun, and illuminated by the latter as the mean disk of the planet is illuminated.

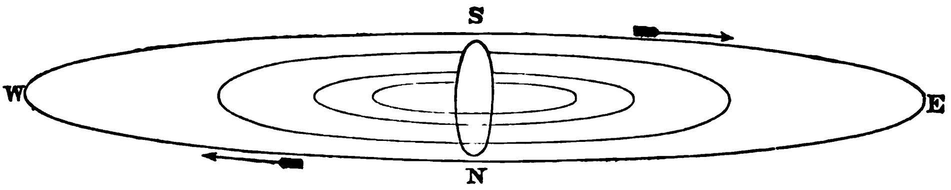
FOR WASHINGTON MEAN NOON.

Date.		*k*	*i*	*θ*	*L*	Date.		*k*	*i*	*θ*	*L*
Jan.	1	0.993	9°.7	0°.0	47.7	Aug.	9	0.316	111°.6	26°.7	183.7
	6	0.990	11.3	357.4	47.9		14	0.277	116.5	27.9	188.4
	11	0.988	12.9	354.8	48.2		19	0.235	121.9	29.5	187.3
	16	0.984	14.6	352.4	48.5		24	0.192	128.0	31.5	180.0
	21	0.980	16.3	350.1	48.9		26	0.176	130.5	32.6	173.5
	26	0.976	17.9	348.0	49.3		28	0.156	133.3	33.8	166.3
	31	0.971	19.6	346.0	49.8		30	0.139	136.2	35.1	157.9
Feb.	5	0.966	21.3	344.3	50.3	Sept.	1	0.122	139.2	36.7	147.2
	10	0.961	22.9	342.9	50.9		3	0.105	142.4	38.7	133.9
	15	0.955	24.6	341.6	51.6		5	0.088	145.7	40.9	118.0
	20	0.948	26.4	340.6	52.3		7	0.072	148.9	43.7	101.8
	25	0.941	28.1	339.9	53.1		9	0.058	152.2	47.3	85.6
Mar.	2	0.934	29.9	339.3	54.0		11	0.044	155.7	51.8	69.4
	7	0.926	31.7	339.0	55.0		13	0.033	159.1	57.7	53.4
	12	0.917	33.6	339.0	56.0		15	0.023	162.3	65.9	38.6
	17	0.908	35.5	339.2	57.1		17	0.017	165.1	77.6	28.2
	22	0.898	37.4	339.6	58.4		19	0.013	167.2	93.8	22.0
	27	0.888	39.3	340.3	59.7		21	0.011	168.0	114.0	19.1
Apr.	1	0.877	41.2	341.3	61.1		23	0.012	167.3	134.7	21.4
	6	0.864	43.2	342.5	62.6		25	0.016	165.4	151.5	26.8
	11	0.851	45.3	343.9	64.2		27	0.023	162.7	163.6	38.9
	16	0.838	47.4	345.6	65.9		29	0.032	159.6	172.2	53.3
	21	0.824	49.5	347.4	67.8	Oct.	1	0.043	156.2	178.3	69.8
	26	0.810	51.6	349.5	69.8		3	0.056	152.7	182.9	87.7
May	1	0.795	53.8	351.7	72.0		5	0.070	149.2	186.5	105.5
	6	0.779	56.0	354.1	74.4		7	0.086	145.8	189.1	123.1
	11	0.763	58.2	356.5	77.1		9	0.104	142.5	191.3	140.2
	16	0.746	60.5	359.0	79.9		11	0.121	139.3	193.1	154.5
	21	0.728	62.8	1.5	82.9		13	0.139	136.2	194.7	167.6
	26	0.709	65.2	3.9	86.3		18	0.185	129.3	197.6	192.2
	31	0.690	67.6	6.3	90.0		23	0.230	123.0	199.7	204.9
June	5	0.670	70.1	8.6	94.0		28	0.272	117.2	201.2	207.8
	10	0.650	72.6	10.7	98.4	Nov.	2	0.313	112.0	202.4	205.6
	15	0.628	75.2	12.7	103.2		7	0.350	107.4	203.3	199.5
	20	0.606	77.8	14.6	108.4		12	0.385	103.3	203.9	190.7
	25	0.583	80.5	16.3	114.3		17	0.418	99.5	204.2	181.4
	30	0.559	83.3	17.9	120.6		22	0.449	95.9	204.3	172.0
July	5	0.533	86.2	19.3	127.4		27	0.478	92.5	204.1	162.5
	10	0.507	89.2	20.5	134.8	Dec.	2	0.506	89.3	203.7	153.6
	15	0.480	92.3	21.6	142.8		7	0.532	86.4	203.0	145.0
	20	0.451	95.7	22.7	151.2		12	0.556	83.6	202.1	136.9
	25	0.420	99.3	23.7	159.9		17	0.580	80.9	200.9	129.5
	30	0.387	103.1	24.7	168.6		22	0.603	78.3	199.5	122.7
Aug.	4	0.353	107.2	25.6	177.0		27	0.623	75.8	197.9	116.4
	9	0.316	111.6	26.7	183.7		32	0.643	73.4	196.1	110.5

THE APPARENT DISK OF MARS.

1887, January	1,	0.976	May	31,	0.997	September 28,	0.951
	31,	0.987	June	30,	0.991	October 28,	0.932
March	2,	0.994	July	30,	0.981	November 27,	0.915
April	1,	0.999	August	29,	0.967	December 27,	0.904
May	1,	1.000					

The numbers in this table are the versed sines of the illuminated disk, the apparent diameter of the planet being taken as unity.



APPARENT ORBITS OF THE SATELLITES OF JUPITER IN 1887, AS SEEN IN AN INVERTING TELESCOPE.

(*The vertical scale is three times the horizontal one.*)

The object of this figure is to facilitate the identification of the satellites in cases where the diagrams of configurations do not suffice for that purpose: reference to the above diagram enables one to identify the inner and outer satellite of the pair. The central, vertical ellipse represents the disk of Jupiter, elongated three times in the vertical direction to correspond to the representation of the orbits of the satellites.

Facing each page of the phenomena of Jupiter's satellites, pages 456—479, is the page of diagrams of configurations, for the same month. The light disks ○ in the vertical row in the middle of the page represent the relative position of Jupiter each day. The dots adjacent in the same horizontal space represent the positions of the several satellites on the same day, at the hour and minute of Washington mean time indicated above the diagrams. The latitudes of the satellites are always considered zero in constructing the diagrams, except where two or more satellites chance to be at nearly the same distance from the planet, when they are placed one above the other according to their apparent latitudes. The numerals designating the satellites are placed on the right or left hand side of the dot, according as the motion of the satellite, for the time of the configuration, is toward the east or toward the west—the motion being always toward the numeral. Frequently, at the epoch of the configuration, one or more satellites will be invisible, being projected on the disk of the planet: this phenomenon is indicated by a light disk ○ at the left hand side of the page. Frequently, also, one or more satellites will be invisible, being concealed in occultation behind the disk, or eclipsed in the shadow of the planet: this phenomenon is indicated by a dark disk ● at the right hand side of the page. In both cases, the annexed numeral serves to point out which satellite is thus rendered invisible.

When an observation is made at a different hour from that for which the diagram is constructed, the motion of the satellite during the interval may be judged by transferring its given position to the above diagram, and estimating its motion during the elapsed interval on the above diagram of the orbits, by means of the following table of the periods:—

MEAN SYNODIC PERIODS OF THE SATELLITES.

	d	h	m	s		d
I.	1	18	28	35.945	=	1.76986048
II.	3	13	17	53.735	=	3.55409416
III.	7	3	59	35.854	=	7.16638720
IV.	16	18	5	6.928	=	16.75355241

WASHINGTON MEAN TIMES OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE I.

		h	m			h	m			h	m			h	m
Jan.	1	13	37.6	Mar.	23	22	48.7	June	13	6	57.7	Sept.	2	17	0.0
	3	8	6.7		25	17	14.8		15	1	25.1		4	11	29.8
	5	2	35.7		27	11	41.0		16	19	52.5		6	5	59.7
	6	21	4.6		29	6	7.2		18	14	20.0		8	0	29.7
	8	15	33.5		31	0	33.2		20	8	47.6		9	18	59.6
	10	10	2.4	Apr.	1	18	59.2		22	3	15.3		11	13	29.7
	12	4	31.1		3	13	25.1		23	21	43.0		13	7	59.7
	13	22	59.8		5	7	51.3		25	16	10.8		15	2	29.7
	15	17	28.4		7	2	17.2		27	10	38.6		16	20	59.8
	17	11	57.0		8	20	43.2		29	5	6.5		18	15	29.8
	19	6	25.5		10	15	9.1		30	23	34.5		20	9	59.9
	21	0	54.0		12	9	35.0	July	2	18	2.6		22	4	30.0
	22	19	22.4		14	4	0.9		4	12	30.6		23	23	0.2
	24	13	50.8		15	22	26.9		6	6	58.8		25	17	30.4
	26	8	19.0		17	16	52.7		8	1	27.1		27	12	0.6
	28	2	47.2		19	11	18.6		9	19	55.4		29	6	30.7
	29	21	15.3		21	5	44.4		11	14	23.8	Oct.	1	1	0.9
	31	15	43.5		23	0	10.3		13	8	52.2		2	19	31.1
Feb.	2	10	11.4		24	18	36.1		15	3	20.7		4	14	1.4
	4	4	39.3		26	13	2.1		16	21	49.3		6	8	31.7
	5	23	7.2		28	7	28.1		18	16	17.8		8	3	2.1
	7	17	35.0		30	1	53.9		20	10	46.6		9	21	32.3
	9	12	2.8	May	1	20	19.9		22	5	15.4		11	16	2.6
	11	6	30.5		3	14	46.0		23	23	44.2		13	10	32.9
	13	0	58.0		5	9	12.0		25	18	13.0				
	14	19	25.7		7	3	38.1		27	12	41.9				
	16	13	53.1		8	22	4.3		29	7	10.9				
	18	8	20.5		10	16	30.4		31	1	39.9				
	20	2	47.8		12	10	56.6	Aug.	1	20	9.0	Dec.	2	0	42.2
	21	21	15.1		14	5	22.8		3	14	38.0		3	19	12.5
	23	15	42.3		15	23	49.1		5	9	7.2		5	13	42.7
	25	10	9.4		17	18	15.4		7	3	36.5		7	8	12.9
	27	4	36.3		19	12	41.9		8	22	5.8		9	2	43.0
	28	23	3.4		21	7	8.3		10	16	35.1		10	21	13.3
Mar.	2	17	30.3		23	1	34.7		12	11	4.6		12	15	43.3
	4	11	57.3		24	20	1.3		14	5	33.9		14	10	13.6
	6	6	24.0		26	14	27.9		16	0	3.4		16	4	43.6
	8	0	50.8		28	8	54.6		17	18	32.9		17	23	13.7
	9	19	17.5		30	3	21.3		19	13	2.4		19	17	43.7
	11	13	44.1		31	21	48.1		21	7	31.9		21	12	13.9
	13	8	10.6	June	2	16	15.0		23	2	1.6		23	6	43.8
	15	2	37.2		4	10	42.0		24	20	31.2		25	1	13.9
	16	21	3.6		6	5	9.0		26	15	0.9		26	19	43.8
	18	15	29.9		7	23	36.1		28	9	30.6		28	14	13.7
	20	9	56.2		9	18	3.2		30	4	0.3		30	8	43.5
	22	4	22.5		11	12	30.4		31	22	30.1		32	3	13.4

WASHINGTON MEAN TIMES OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE II.

		h m			h m			h m			h m
Jan.	0	23 52.4	Mar.	27	5 34.7	June	20	9 26.7	Sept.	13	17 24.6
	4	13 12.1		30	18 43.7		23	22 41.9		17	6 48.6
	8	2 31.2	Apr.	3	7 51.6		27	11 56.7		20	20 12.2
	11	15 49.9		6	21 0.1	July	1	1 13.1		24	9 36.3
	15	5 8.0		10	10 7.5		4	14 29.0		27	23 0.3
	18	18 26.1		13	23 15.7		8	3 46.5	Oct.	1	12 24.5
	22	7 43.6		17	12 22.9		11	17 3.4		5	1 48.6
	25	21 0.7		21	1 31.1		15	6 21.9		8	15 12.8
	29	10 17.2		24	14 38.3		18	19 39.9		12	4 37.3
Feb.	1	23 33.5		28	3 46.8		22	8 59.2		15	18 1.8
	5	12 49.0	May	1	16 54.2		25	22 18.1			
	9	2 4.3		5	6 3.0		29	11 38.3			
	12	15 18.7		8	19 10.8	Aug.	2	0 58.0			
	16	4 33.0		12	8 20.1		5	14 19.0			
	19	17 46.4		15	21 28.7		9	3 39.5	Dec.	1	0 16.7
	23	6 59.6		19	10 38.8		12	17 1.1		4	13 40.3
	26	20 11.8		22	23 48.3		16	6 22.3		8	3 3.8
Mar.	2	9 24.1		26	12 59.3		19	19 44.5		11	16 27.1
	5	22 35.3		30	2 9.7		23	9 6.4		15	5 50.2
	9	11 46.6	June	2	15 21.6		26	22 29.1		18	19 13.1
	13	0 56.8		6	4 33.1		30	11 51.6		22	8 35.9
	16	14 7.3		9	17 46.2	Sept.	3	1 14.8		25	21 58.3
	20	3 16.6		13	6 58.8		6	14 37.7		29	11 20.6
	23	16 26.3		16	20 13.0		10	4 1.4		33	0 42.7

SATELLITE III.

		h m			h m			h m			h m
Jan.	5	5 58.9	Apr.	1	2 34.3	June	25	19 35.4	Sept.	19	20 58.5
	12	10 4.5		8	5 52.4	July	2	23 23.0		27	1 22.6
	19	14 7.2		15	9 9.3		10	3 14.4	Oct.	4	5 47.4
	26	18 5.5		22	12 25.6		17	7 9.9		11	10 13.3
Feb.	2	21 59.8		29	15 42.9		24	11 9.6		18	14 39.7
	10	1 49.1	May	6	19 0.9		31	15 13.1			
	17	5 33.8		13	22 21.1	Aug.	7	19 20.7	Nov.	30	17 25.9
	24	9 14.1		21	1 43.5		14	23 30.8	Dec.	7	21 51.9
Mar.	3	12 50.0		28	5 9.2		22	3 43.9		15	2 16.9
	10	16 22.2	June	4	8 38.9		29	7 59.4		22	6 40.8
	17	19 49.7		11	12 13.1	Sept.	5	12 16.8		29	11 3.3
	24	23 13.8		18	15 52.3		12	16 36.7		36	15 24.6

SATELLITE IV.

		h m			h m			h m			h m
Jan.	7	4 42.0	Apr.	17	5 50.9	July	26	4 58.5	Nov.	4	4 2.2
	23	23 3.0	May	3	20 4.3	Aug.	11	23 39.0		21	0 39.7
Feb.	9	16 32.9		20	10 38.3		28	18 57.7	Dec.	7	21 12.1
	26	9 6.5	June	6	1 54.0	Sept.	14	14 47.0		24	17 31.7
Mar.	15	0 42.7		22	18 0.9	Oct.	1	10 58.7		41	13 29.8
	31	15 31.6	July	9	11 3.5		18	7 26.1			

WASHINGTON MEAN TIME.

JANUARY.

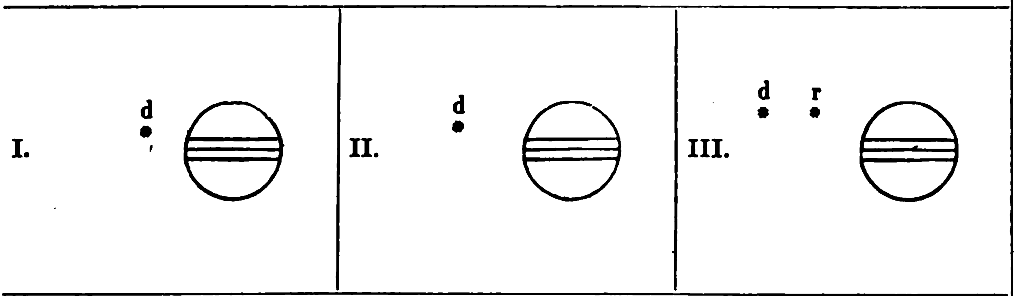
d	h	m	s			
1	1	10		II.	Oc.	Re.
	9	55		III.	Sh.	In.
	11	24	26.9	I.	Ec.	Dis.
	12	11		III.	Sh.	Eg.
	14	42		III. *	Tr.	In.
	14	44		I. *	Oc.	Re.
	16	40		III. *	Tr.	Eg.
2	8	31		I.	Sh.	In.
	9	40		I.	Tr.	In.
	10	44		I.	Sh.	Eg.
	11	53		I.	Tr.	Eg.
	15	19		II. *	Sh.	In.
	17	38		II. *	Tr.	In.
	17	59		II. *	Sh.	Eg.
	20	14		II.	Tr.	Eg.
3	5	52	51.1	I.	Ec.	Dis.
	9	13		I.	Oc.	Re.
4	2	59		I.	Sh.	In.
	4	9		I.	Tr.	In.
	5	13		I.	Sh.	Eg.
	6	22		I.	Tr.	Eg.
	9	36	34.9	II.	Ec.	Dis.
	14	30		II. *	Oc.	Re.
5	0	13	55.2	III.	Ec.	Dis.
	0	21	7 5	I.	Ec.	Dis.
	2	16	0.2	III.	Ec.	Re.
	3	42		I.	Oc.	Re.
	5	1		III.	Oc.	Dis.
	6	56		III.	Oc.	Re.
	21	27		I.	Sh.	In.
	22	38		I.	Tr.	In.
	23	41		I.	Sh.	Eg.
6	0	51		I.	Tr.	Eg.
	4	36		II.	Sh.	In.
	6	59		II.	Tr.	In.
	7	16		II.	Sh.	Eg.
	9	34		II.	Tr.	Eg.
	18	49	29.7	I.	Ec.	Dis.
	22	11		I.	Oc.	Re.
7	15	55		I. *	Sh.	In.
	17	7		I. *	Tr.	In.
	18	10		I. *	Sh.	Eg.
	19	20		I.	Tr.	Eg.
	22	53	12.3	II.	Ec.	Dis.
8	3	49		II.	Oc.	Re.
	13	17	47.7	I.	Ec.	Dis.
	13	53		III.	Sh.	In.
	16	9		III. *	Sh.	Eg.
	16	40		I. *	Oc.	Re.
	18	52		III.	Tr.	In.
	20	45		III.	Tr.	Eg.
9	10	24		I.	Sh.	In.
	11	36		I.	Tr.	In.
	12	38		I.	Sh.	Eg.
	13	48		I.	Tr.	Eg.
	17	54		II. *	Sh.	In.
	20	19		II.	Tr.	In.
	20	33		II.	Sh.	Eg.
	22	53		II.	Tr.	Eg.
10	7	46	10.8	I.	Ec.	Dis.
	11	9		I.	Oc.	Re.
11	4	52		I.	Sh.	In.
	6	5		I.	Tr.	In.
	7	6		I.	Sh.	Eg.
	8	17		I.	Tr.	Eg.
11	12	9	57.5	II.	Ec.	Dis.
	17	7		II. *	Oc.	Re.
12	2	14	26.9	I.	Ec.	Dis.
	4	11	39.5	III.	Ec.	Dis.
	5	37		I.	Oc.	Re.
	6	12	37.7	III.	Ec.	Re.
	9	9		III.	Oc.	Dis.
	11	0		III.	Oc.	Re.
	23	20		I.	Sh.	In.
13	0	34		I.	Tr.	In.
	1	34		I.	Sh.	Eg.
	2	46		I.	Tr.	Eg.
	7	12		II.	Sh.	In.
	9	38		II.	Tr.	In.
	9	50		II.	Sh.	Eg.
	12	12		II.	Tr.	Eg.
	20	42	48.3	I.	Ec.	Dis.
14	0	6		I.	Oc.	Re.
	17	49		I. *	Sh.	In.
	19	2		I.	Tr.	In.
	20	2		I.	Sh.	Eg.
	21	14		I.	Tr.	Eg.
15	1	26	36.8	II.	Ec.	Dis.
	6	25		II.	Oc.	Re.
	15	11	5.1	I. *	Ec.	Dis.
	17	50		III. *	Sh.	In.
	18	34		I.	Oc.	Re.
	20	5		III.	Sh.	Eg.
	22	58		III.	Tr.	In.
16	0	47		III.	Tr.	Eg.
	12	17		I.	Sh.	In.
	13	31		I.	Tr.	In.
	14	31		I. *	Sh.	In.
	15	43		I. *	Tr.	Eg.
	20	29		II.	Sh.	In.
	22	57		II.	Tr.	In.
	23	8		II.	Sh.	Eg.
17	1	31		II.	Tr.	Eg.
	9	39	27.7	I.	Ec.	Dis.
	13	3		I.	Oc.	Re.
18	6	45		I.	Sh.	In.
	7	59		I.	Tr.	In.
	8	59		I.	Sh.	Eg.
	10	11		I.	Tr.	Eg.
	14	43	27.4	II. *	Ec.	Dis.
	19	43		II.	Oc.	Re.
19	4	7	43.5	I.	Ec.	Dis.
	7	31		I.	Oc.	Re.
	8	9	59.2	III.	Ec.	Dis.
	10	9	51.0	III.	Ec.	Re.
	13	14		III.	Oc.	Dis.
	15	0		III. *	Oc.	Re.
20	1	14		I.	Sh.	In.
	2	28		I.	Tr.	In.
	3	27		I.	Sh.	Eg.
	4	39		I.	Tr.	Eg.
	9	46		II.	Sh.	In.
	12	15		II.	Tr.	In.
	12	25		II.	Sh.	Eg.
	14	49		II. *	Tr.	Eg.
	22	36	4.3	I.	Ec.	Dis.
21	2	0		I.	Oc.	Re.
	19	42		I.	Sh.	In.
	20	56		I.	Tr.	In.
21	21	55		I.	Sh.	Eg.
	23	8		I.	Tr.	Eg.
22	4	0	9.2	II.	Ec.	Dis.
	9	0		II.	Oc.	Re.
	17	4	20.7	I. *	Ec.	Dis.
	20	28		I.	Oc.	Re.
	21	47		III.	Sh.	In.
23	0	1		III.	Sh.	Eg.
	3	0		III.	Tr.	In.
	4	44		III.	Tr.	Eg.
	14	10		I. *	Sh.	In.
	15	25		I. *	Tr.	In.
	16	23		I. *	Sh.	Eg.
	17	36		I. *	Tr.	Eg.
	23	3		II.	Sh.	In.
24	1	33		II.	Tr.	In.
	1	42		II.	Sh.	Eg.
	4	6		II.	Tr.	Eg.
	11	32	42.8	I.	Ec.	Dis.
	14	57		I. *	Oc.	Re.
25	8	38		I.	Sh.	In.
	9	53		I.	Tr.	In.
	10	51		I.	Sh.	Eg.
	12	4		I.	Tr.	Eg.
	17	17	5.7	II. *	Ec.	Dis.
	22	17		II.	Oc.	Re.
26	6	0	58.1	I.	Ec.	Dis.
	9	25		I.	Oc.	Re.
	12	7	48.4	III.	Ec.	Dis.
	14	6	34.0	III. *	Ec.	Re.
	17	14		III. *	Oc.	Dis.
	18	57		III.	Oc.	Re.
27	3	6		I.	Sh.	In.
	4	21		I.	Tr.	In.
	5	19		I.	Sh.	Eg.
	6	32		I.	Tr.	Eg.
	12	20		II.	Sh.	In.
	14	50		II. *	Tr.	In.
	14	59		II. *	Sh.	Eg.
	17	23		II. *	Tr.	Eg.
28	0	29	17.8	I.	Ec.	Dis.
	3	53		I.	Oc.	Re.
	21	34		I.	Sh.	In.
	22	49		I.	Tr.	In.
	23	47		I.	Sh.	Eg.
29	1	0		I.	Tr.	Eg.
	6	33	50.1	II.	Ec.	Dis.
	11	33		II.	Oc.	Re.
	18	57	34.1	I.	Ec.	Dis.
	22	21		I.	Oc.	Re.
30	1	45		III.	Sh.	In.
	3	57		III.	Sh.	Eg.
	6	58		III.	Tr.	In.
	8	38		III.	Tr.	Eg.
	16	3		I. *	Sh.	In.
	17	17		I. *	Tr.	In.
	18	16		I. *	Sh.	Eg.
	19	28		I.	Tr.	Eg.
31	1	38		II.	Sh.	In.
	4	7		II.	Tr.	In.
	4	16		II.	Sh.	Eg.
	6	40		II.	Tr.	Eg.
	13	25	55.7	I. *	Ec.	Dis.
	16	49		I. *	Oc.	Re.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

JANUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 16h 0m for an Inverting Telescope.

Day.	West.	East.
1	○ 3· 4·	○ ·1 ·2
2	4· 3· 1· 2	○ ·
3	·4 ·3 ·2	○ ·1
4	·4 ·3 ·1	○ ·2
5	·4	○ $_{1\cdot}{}^{3}$ 2·
6	2:^{4}·1	○
7	·2	○ 1· ·4 3·
8		○ 3· ·2 ·4 ·1 ●
9	3· 1·	○ 2· ·4
10	·3 2·	○ ·1 ·4
11	·3 1·	○ 4· ·2 ●
12		○ ·3 1· 2· 4·
13	$^{\cdot 1}{}_{2\cdot}$	○ ·3 4·
14	·2	○ 1· 4· 3·
15	4·	·1 ○ 3· ·2
16	4· 3· 1·	○ 2·
17	4· 3· 2·	○ ·1
18	4· ·3 1· ·	○ 2
19	4·	○ ·3 ·1 2·
20	·4 ·1 2·	○ ·3
21	·4 ·2	○ 1· 3·
22	·4 ·1	○ $^{2}{}_{3\cdot}$
23	○ 1· 3· ·4	○ 2·
24	3· 2·	○ ·1 ·4
25	·3 $_{1\cdot}{}^{2}$	○ ·4
26	·	○ 3 ·1 ·2 ·4
27	○ 2· 1·	○ ·3 ·4
28	·2	○ 1· 3· 4·
29	·1	○ ·2 3· 4·
30	3·	○ 1· 2· 4·
31	3· 2·	○ 4· ·1 ●

WASHINGTON MEAN TIME.

FEBRUARY.

d	h	m	s			
1	10	31		I.	Sh.	In.
	11	45		I.	Tr.	In.
	12	44		I.	Sh.	Eg.
	13	56		I. *	Tr.	Eg.
	19	50	53.0	II.	Ec.	Dis.
2	0	50		II.	Oc.	Re.
	7	54	10.5	I.	Ec.	Dis.
	11	17		I.	Oc.	Re.
	16	5	49.9	III. *	Ec.	Dis
	18	3	30.3	III. *	Ec.	Re.
	21	11		III.	Oc.	Dis.
	22	49		III.	Oc.	Re.
3	4	59		I.	Sh.	In.
	6	13		I.	Tr.	In.
	7	12		I.	Sh.	Eg.
	8	24		I.	Tr.	Eg.
	14	55		II. *	Sh.	In.
	17	23		II. *	Tr.	In.
	17	33		II. *	Sh.	Eg.
	19	56		II.	Tr.	Eg.
4	2	22	30.1	I.	Ec.	Dis.
	5	45		I.	Oc.	Re.
	23	28		I.	Sh.	In.
5	0	41		I.	Tr.	In.
	1	41		I.	Sh.	Eg.
	2	52		I.	Tr.	Eg.
	9	7	40.6	II.	Ec.	Dis.
	14	5		II. *	Oc.	Re.
	20	50	46.0	I.	Ec.	Dis.
6	0	13		I.	Oc.	Re.
	5	42		III.	Sh.	In.
	7	54		III.	Sh.	Eg.
	10	52		III.	Tr.	In.
	12	27		III.	Tr.	Eg.
	17	56		I. *	Sh.	In.
	19	9		I.	Tr.	In.
	20	9		I.	Sh.	Eg.
	21	20		I.	Tr.	Eg.
7	4	12		II.	Sh.	In.
	6	39		II.	Tr.	In.
	6	50		II.	Sh.	Eg.
	9	11		II.	Tr.	Eg.
	15	19	7.0	I. *	Ec.	Dis.
	18	41		I.	Oc.	Re.
8	12	24		I. *	Sh.	In.
	13	37		I. *	Tr.	In.
	14	38		I. *	Sh.	Eg.
	15	48		I. *	Tr.	Eg.
	22	24	50.5	II.	Ec.	Dis.
9	3	20		II.	Oc.	Re.
	9	47	22.3	I.	Ec.	Dis.
	13	8		I. *	Oc.	Re.
	20	3	19.1	III.	Ec.	Dis.
	21	59	54.7	III.	Ec.	Re.
10	1	2		III.	Oc.	Dis.
	2	36		III.	Oc.	Re.
	6	53		I.	Sh.	In.
	8	4		I.	Tr.	In.
	9	6		I.	Sh.	Eg.

d	h	m	s			
10	10	16		I.	Tr.	Eg.
	17	29		II. *	Sh.	In.
	19	54		II.	Tr.	In.
	20	7		II.	Sh.	Eg.
	22	26		II.	Tr.	Eg.
11	4	15	41.4	I.	Ec.	Dis.
	7	36		I.	Oc.	Re.
12	1	21		I.	Sh.	In.
	2	32		I.	Tr.	In.
	3	35		I.	Sh.	Eg.
	4	44		I.	Tr.	Eg.
	11	41	41.5	II.	Ec.	Dis.
	16	34		II. *	Oc.	Re.
	22	43	57.2	I.	Ec.	Dis.
13	2	4		I.	Oc.	Re.
	9	41		III.	Sh.	In.
	11	51		III.	Sh.	Eg.
	14	42		III. *	Tr.	In.
	16	13		III. *	Tr.	Eg.
	19	49		I.	Sh.	In.
	21	0		I.	Tr.	In.
	22	3		I.	Sh.	Eg.
	23	12		I.	Tr.	Eg.
14	6	46		II.	Sh.	In.
	9	9		II.	Tr.	In.
	9	24		II.	Sh.	Eg.
	11	40		II.	Tr.	Eg.
	17	12	18.3	I. *	Ec.	Dis.
	20	31		I.	Oc.	Re.
15	14	18		I. *	Sh.	In.
	15	27		I. *	Tr.	In.
	16	31		I. *	Sh.	Eg.
	17	39		I. *	Tr.	Eg.
16	0	58	59.1	II.	Ec.	Dis.
	5	49		II.	Oc.	Re.
	11	40	33.6	I.	Ec.	Dis.
	14	59		I. *	Oc.	Re.
17	0	0	42.9	III.	Ec.	Dis.
	1	56	13.9	III.	Ec.	Re.
	4	49		III.	Oc.	Dis.
	6	19		III.	Oc.	Re.
	8	46		I.	Sh.	In.
	9	55		I.	Tr.	In.
	10	59		I.	Sh.	Eg.
	12	7		I. *	Tr.	Eg.
	20	3		II.	Sh.	In.
	22	23		II.	Tr.	In.
	22	41		II.	Sh.	Eg.
18	0	54		II.	Tr.	Eg.
	6	8	52.6	I.	Ec.	Dis.
	9	26		I.	Oc.	Re.
19	3	14		I.	Sh.	In.
	4	22		I.	Tr.	In.
	5	27		I.	Sh.	Eg.
	6	34		I.	Tr.	Eg.
	14	15	53.9	II. *	Ec.	Dis.
	19	2		II.	Oc.	Re.
20	0	37	8.7	I.	Ec.	Dis.

d	h	m	s			
20	3	53		I.	Oc.	Re.
	13	38		III. *	Sh.	In.
	15	48		III. *	Sh.	Eg.
	18	27		III.	Tr.	In.
	19	53		III.	Tr.	Eg.
	21	43		I.	Sh.	In.
	22	49		I.	Tr.	In.
	23	56		I.	Sh.	Eg.
21	1	1		I.	Tr.	Eg.
	9	21		II.	Sh.	In.
	11	36		II. *	Tr.	In.
	11	58		II. *	Sh.	Eg.
	14	7		II. *	Tr.	Eg.
	19	5	30.0	I.	Ec.	Dis.
	22	21		I.	Oc.	Re.
22	16	11		I. *	Sh.	In.
	17	17		I. *	Tr.	In.
	18	24		I.	Sh.	Eg.
	19	28		I.	Tr.	Eg.
23	3	33	19.7	II.	Ec.	Dis.
	8	15		II.	Oc.	Re.
	13	33	45.6	I. *	Ec.	Dis.
	16	48		I. *	Oc.	Re.
24	3	58	18.6	III.	Ec.	Dis.
	5	52	45.6	III.	Ec.	Re.
	8	32		III.	Oc.	Dis.
	9	56		III.	Oc.	Re.
	10	39		I.	Sh.	In.
	11	44		I. *	Tr.	In.
	12	52		I. *	Sh.	Eg.
	13	55		I. *	Tr.	Eg.
	22	38		II.	Sh.	In.
25	0	49		II.	Tr.	In.
	1	15		II.	Sh.	Eg.
	3	19		II.	Tr.	Eg.
	8	2	4.8	I.	Ec.	Dis.
	11	15		I. *	Oc.	Re.
26	5	8		I.	Sh.	In.
	6	11		I.	Tr.	In.
	7	21		I.	Sh.	Eg.
	8	22		I.	Tr.	Eg.
	16	50	18.9	II. *	Ec.	Dis.
	21	27		II.	Oc.	Re.
27	2	30	21.4	I.	Ec.	Dis.
	5	42		I.	Oc.	Re.
	17	37		III. *	Sh.	In.
	19	45		III.	Sh.	Eg.
	22	7		III.	Tr.	In.
	23	30		III.	Tr.	Eg.
	23	36		I.	Sh.	In.
28	0	38		I.	Tr.	In.
	1	49		I.	Sh.	Eg.
	2	49		I.	Tr.	Eg.
	11	55		II. *	Sh.	In.
	14	1		II. *	Tr.	In.
	14	32		II. *	Sh.	Eg.
	16	31		II. *	Tr.	Eg.
	20	58	42.7	I.	Ec.	Dis.

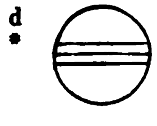
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse. Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

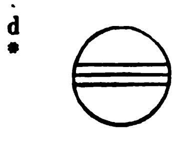
FEBRUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

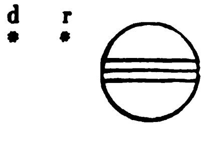
I.



II.



III.



Configurations at 15ʰ 0ᵐ for an Inverting Telescope.

Day.	West.		East.
1	·3 ·2 4· 1·	○	
2	4· ·3	○	·1 ·2
3	4· 1·	○	2· ·3
4	4· 2·	○	·1 ·3
5	·4 ·1	○	·2 3·
6	·4 3·	○	1· 2·
7	·4 3· 2· ·1	○	
8	○ 1· ·3 ·4 ·2	○	
9	·3	·4 ○	·1 ·2
10	1·	○	2· ·3 ·4
11	2·	○	·1 ·3 ·4
12	·1	○	3· ·4 ·2 ●
13	○ 3·	○	1· 2· ·4
14	3· 2· ·1	○	4·
15	·3 ·2	○	1· 4·
16	·3	○	·1 ·2 4·
17	1·	○	4· 2· ·3
18	2· 4·	○	·1 ·3
19	4· 1· ·2	○	3·
20	4·	○	3· 1· ·2
21	4· 3· ·1 2·	○	
22	·4 ·3 ·2	○	1·
23	·4 ·3	○	·2 ·1 ●
24	·4 1·	○	·3 2·
25	2· ·4	○	·1 ·3
26	1· ·2	○	·4 3·
27		○	3· ·1 ·2 ·4
28	○ 2· 3· ·1	○	·4

WASHINGTON MEAN TIME.

MARCH.

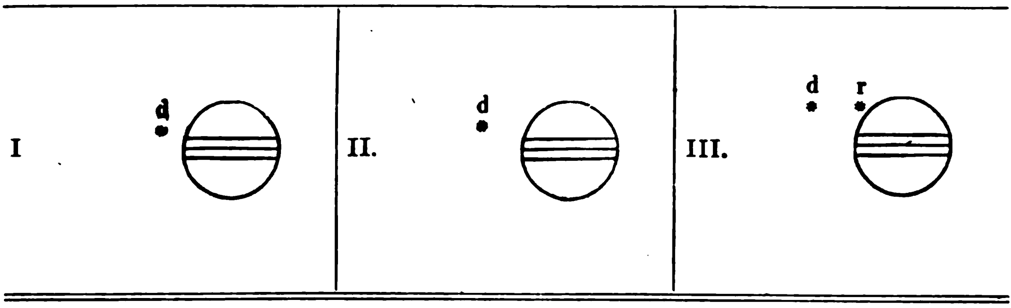
d	h	m	s			
1	0	9		I.	Oc.	Re.
	18	4		I.	Sh.	In.
	19	5		I.	Tr.	In.
	20	17		I.	Sh.	Eg.
	21	16		I.	Tr.	Eg.
2	6	7	53.5	II.	Ec.	Dis.
	10	39		II.	Oc.	Re.
	15	26	59.0	I. *	Ec.	Dis.
	18	36		I.	Oc.	Re.
3	7	56	2.3	III.	Ec.	Dis.
	9	49	26.1	III.	Ec.	Re.
	12	9		III. *	Oc.	Dis.
	12	33		I. *	Sh.	In.
	13	31		III. *	Oc.	Re.
	13	32		I. *	Tr.	In.
	14	46		I. *	Sh.	Eg.
	15	43		I. *	Tr.	Eg.
4	1	12		II.	Sh.	In.
	3	12		II.	Tr.	In.
	3	49		II.	Sh.	Eg.
	5	42		II.	Tr.	Eg.
	9	55	18.6	I.	Ec.	Dis.
	13	3		I. *	Oc.	Re.
5	7	1		I.	Sh.	In.
	7	59		I.	Tr.	In.
	9	14		I.	Sh.	Eg.
	10	10		I.	Tr.	Eg.
	19	24	57.2	II.	Ec.	Dis.
	23	50		II.	Oc.	Re.
6	4	23	35.9	I.	Ec.	Dis.
	7	29		I.	Oc.	Re.
	21	34		III.	Sh.	In.
	23	41		III.	Sh.	Eg.
7	1	29		I.	Sh.	In.
	1	42		III.	Tr.	In.
	2	26		I.	Tr.	In.
	3	2		III.	Tr.	Eg.
	3	42		I.	Sh.	Eg.
	4	37		I.	Tr.	Eg.
	14	29		II. *	Sh.	In.
	16	23		II. *	Tr.	In.
	17	6		II. *	Sh.	Eg.
	18	53		II.	Tr.	Eg.
	22	51	57.9	I.	Ec.	Dis.
8	1	56		I.	Oc.	Re.
	19	58		I.	Sh.	In.
	20	53		I.	Tr.	In.
	22	11		I.	Sh.	Eg.
	23	3		I.	Tr.	Eg.
9	8	42	40.6	II.	Ec.	Dis.
	13	1		II. *	Oc.	Re.
	17	20	15.1	I. *	Ec.	Dis.
	20	23		I.	Oc.	Re.
10	11	54	27.0	III. *	Ec.	Dis.
	13	46	48.6	III. *	Ec.	Re.
	14	26		I. *	Sh.	In.
	15	20		I. *	Tr.	In.
	15	43		III. *	Oc.	Dis.
	16	39		I. *	Sh.	Eg.
	17	2		III. *	Oc.	Re.
	17	30		I. *	Tr.	Eg.
11	3	45		II.	Sh.	In.
	5	33		II.	Tr.	In.
	6	22		II.	Sh.	Eg.
11	8	3		II.	Tr.	Eg.
	11	48	35.3	I. *	Ec.	Dis.
	14	49		I. *	Oc.	Re.
12	8	54		I.	Sh.	In.
	9	46		I.	Tr.	In.
	11	7		I. *	Sh.	Eg.
	11	57		I. *	Tr.	Eg.
	21	59	49.4	II.	Ec.	Dis.
13	2	12		II.	Oc.	Re.
	6	16	53.4	I.	Ec.	Dis.
	9	16		I.	Oc.	Re.
14	1	32		III.	Sh.	In.
	3	23		I.	Sh.	In.
	3	38		III.	Sh.	Eg.
	4	13		I.	Tr.	In.
	5	12		III.	Tr.	In.
	5	35		I.	Sh.	Eg.
	6	23		I.	Tr.	Eg.
	6	31		III.	Tr.	Eg.
	17	2		II. *	Sh.	In.
	18	43		II.	Tr.	In.
	19	39		II.	Sh.	Eg.
	21	13		II.	Tr.	Eg.
15	0	45	16.3	I.	Ec.	Dis.
	3	43		I.	Oc.	Re.
	21	51		I.	Sh.	In.
	22	39		I.	Tr.	In.
16	0	4		I.	Sh.	Eg.
	0	50		I.	Tr.	Eg.
	11	17	42.0	II. *	Ec.	Dis.
	15	22		II. *	Oc.	Re.
	19	13	34.5	I.	Ec.	Dis.
	22	9		I.	Oc.	Re.
17	15	52	25.5	III. *	Ec.	Dis.
	16	19		I. *	Sh.	In.
	17	6		I. *	Tr.	In.
	17	43	46.3	III.	Ec.	Re.
	18	32		I.	Sh.	Eg.
	19	10		III.	Oc.	Dis.
	19	17		I.	Tr.	Eg.
	20	29		III.	Oc.	Re.
18	6	19		II.	Sh.	In.
	7	52		II.	Tr.	In.
	8	56		II.	Sh.	Eg.
	10	22		II. *	Tr.	Eg.
	13	41	55.4	I. *	Ec.	Dis.
	16	35		I. *	Oc.	Re.
19	10	48		I. *	Sh.	In.
	11	32		I. *	Tr.	In.
	13	1		I. *	Sh.	Eg.
	13	43		I. *	Tr.	Eg.
20	0	34	55.7	II.	Ec.	Dis.
	4	31		II.	Oc.	Re.
	8	10	14.6	I.	Ec.	Dis.
	11	1		I. *	Oc.	Re.
21	5	16		I.	Sh.	In.
	5	30		III.	Sh.	In.
	5	59		I.	Tr.	In.
	7	29		I.	Sh.	Eg.
	7	35		III.	Sh.	Eg.
	8	10		I.	Tr.	Eg.
	8	38		III.	Tr.	In.
	9	57		III. *	Tr.	Eg.
21	19	36		II.	Sh.	In.
	21	1		II.	Tr.	In.
	22	13		II.	Sh.	Eg.
	23	31		II.	Tr.	Eg.
22	2	38	38.0	I.	Ec.	Dis.
	5	28		I.	Oc.	Re.
	23	45		I.	Sh.	In.
23	0	25		I.	Tr.	In.
	1	57		I.	Sh.	Eg.
	2	36		I.	Tr.	Eg.
	13	52	57.9	II. *	Ec.	Dis.
	17	40		II.	Oc.	Re.
	21	6	57.7	I.	Ec.	Dis.
	23	54		I.	Oc.	Re.
24	18	13		I.	Sh.	In.
	18	51		I.	Tr.	In.
	19	50	40.6	III.	Ec.	Dis.
	20	26		I.	Sh.	Eg.
	21	2		I.	Tr.	Eg.
	21	41	1.4	III.	Ec.	Re.
	22	34		III.	Oc.	Dis.
	23	53		III.	Oc.	Re.
25	8	53		II.	Sh.	In.
	10	10		II. *	Tr.	In.
	11	30		II. *	Sh.	Eg.
	12	40		II. *	Tr.	Eg.
	15	35	19.6	I. *	Ec.	Dis.
	18	20		I.	Oc.	Re.
26	12	42		I. *	Sh.	In.
	13	18		I. *	Tr.	In.
	14	54		I. *	Sh.	Eg.
	15	28		I. *	Tr.	Eg.
27	3	10	16.9	II.	Ec.	Dis.
	6	49		II.	Oc.	Re.
	10	3	39.7	I. *	Ec.	Dis.
	12	46		I. *	Oc.	Re.
28	7	10		I.	Sh.	In.
	7	44		I.	Tr.	In.
	9	22		I. *	Sh.	Eg.
	9	28		III. *	Sh.	In.
	9	54		I. *	Tr.	Eg.
	11	32		III. *	Sh.	Eg.
	12	0		III. *	Tr.	In.
	13	19		III. *	Tr.	Eg.
	22	10		II.	Sh.	In.
	23	18		II.	Tr.	In.
29	0	47		II.	Sh.	Eg.
	1	48		II.	Tr.	Eg.
	4	32	4.2	I.	Ec.	Dis.
	7	12		I.	Oc.	Re.
30	1	39		I.	Sh.	In.
	2	10		I.	Tr.	In.
	3	51		I.	Sh.	Eg.
	4	20		I.	Tr.	Eg.
	16	28	28.1	II. *	Ec.	Dis.
	19	58		II.	Oc.	Re.
	23	0	25.2	I.	Ec.	Dis.
31	1	38		I.	Oc.	Re.
	20	7		I.	Sh.	In.
	20	36		I.	Tr.	In.
	22	19		I.	Sh.	Eg.
	22	47		I.	Tr.	Eg.
	23	48	29.9	III.	Ec.	Dis.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME

MARCH.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 13h 30m for an Inverting Telescope.

Day.	West.		East.
1	3· ·2	○	1· ·4
2	·3 ·1	○	·2 4·
3	1	○·	2· 4· ·3 ●
4	2·	○	·1 ·3 4·
5	·2 1·	○	4· 3·
6	4	○·	·1 3· ·2
7	4· 1· 3·	○	2·
8	4· 3· 2·	○	1·
9	4· ·3 ·1	○	·2
10	4· ·3	○	1· 2·
11	·4 2·	○	·3 ·1 ●
12	·4 ·2 1·	○	3·
13	·4	○	·1 ·2 3·
14	1· ·4 3·	○	2·
15	3· 2·	○	·4 1·
16	·3 ·1	○	·4 ·2 ●
17	·3	○	1· 2· ·4
18	2· ·	○1	·3 ·4
19	○ 1· ·2	○	·3 4·
20		○	·1 2· 3· 4·
21	1· 3·	○	2· 4·
22	3· 2·	○	·1 4·
23	·3 ·1 4· ·2	○	
24	4· ·3	○	1· ·2
25	4· ·1 2·	○	·3
26	○ 1· 4· ·2	○	·3
27	·4	○	·1 ·2 3·
28	○ 3· ·4 1·	○	2·
29	·4 3· 2·	○	·1
30	·3 ·4 1· ·2	○	
31	·3	·4 ○	1· ·2

WASHINGTON MEAN TIME.

APRIL.

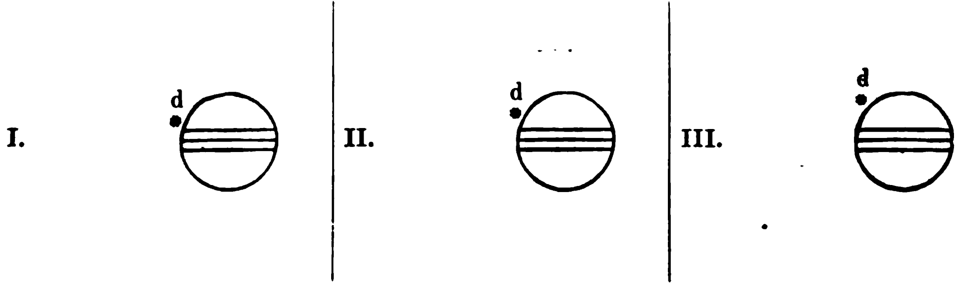
d	h	m	s			
1	1	37	51.1	III.	Ec.	Re.
	1	55		III.	Oc.	Dis.
	3	14		III.	Oc.	Re.
	11	26		II. *	Sh.	In.
	12	25		II. *	Tr.	In.
	14	4		II. *	Sh.	Eg.
	14	55		II. *	Tr.	Eg.
	17	28	47.9	I.	Ec.	Dis.
	20	4		I.	Oc.	Re.
2	14	36		I. *	Sh.	In.
	15	2		I. *	Tr.	In.
	16	48		I. *	Sh.	Eg.
	17	13		I.	Tr.	Eg.
3	5	45	53.1	II.	Ec.	Dis.
	9	7		II. *	Oc.	Re.
	11	57	9.7	I. *	Ec.	Dis.
	14	30		I. *	Oc.	Re.
4	9	4		I. *	Sh.	In.
	9	28		I. *	Tr.	In.
	11	16		I. *	Sh.	Eg.
	11	39		I. *	Tr.	Eg.
	13	27		III. *	Sh.	In.
	15	20		III. *	Tr.	In.
	15	30		III. *	Sh.	Eg.
	16	40		III. *	Tr.	Eg.
5	0	43		II.	Sh.	In.
	1	32		II.	Tr.	In.
	3	20		II.	Sh.	Eg.
	4	2		II.	Tr.	Eg.
	6	25	35.4	I.	Ec.	Dis.
	8	57		I. *	Oc.	Re.
6	3	33		I.	Sh.	In.
	3	54		I.	Tr.	In.
	5	45		I.	Sh.	Eg.
	6	5		I.	Tr.	Eg.
	19	4	13.7	II.	Ec.	Dis.
	22	15		II.	Oc.	Re.
7	0	53	58.0	I.	Ec.	Dis.
	3	23		I.	Oc.	Re.
	22	1		I.	Sh.	In.
	22	20		I.	Tr.	In.
8	0	13		I.	Sh.	Eg.
	0	31		I.	Tr.	Eg.
	3	46	19.7	III.	Ec.	Dis.
	6	32		III.	Oc.	Re.
	14	0		II. *	Sh.	In.
	14	38		II. *	Tr.	In.
	16	37		II. *	Sh.	Eg.
	17	9		II.	Tr.	Eg.
	19	22	22.4	I.	Ec.	Dis.
	21	49		I.	Oc.	Re.
9	16	30		I. *	Sh.	In.
	16	46		I. *	Tr.	In.
	18	42		I.	Sh.	Eg.
	18	57		I.	Tr.	Eg.
10	8	21	44.8	II. *	Ec.	Dis.
	11	23		II. *	Oc.	Re.
	13	50	45.3	I. *	Ec.	Dis.
	16	14		I. *	Oc.	Re.
11	10	58		I. *	Sh.	In.
11	11	12		I. *	Tr.	In.
	13	10		I. *	Sh.	Eg.
	13	23		I. *	Tr.	Eg.
	17	26		III.	Sh.	In.
	18	37		III.	Tr.	In.
	19	28		III.	Sh.	Eg.
	19	59		III.	Tr.	Eg.
12	3	17		II.	Sh.	In.
	3	45		II.	Tr.	In.
	5	53		II.	Sh.	Eg.
	6	16		II.	Tr.	Eg.
	8	19	12.5	I. *	Ec.	Dis.
	10	40		I. *	Oc.	Re.
13	5	27		I.	Sh.	In.
	5	38		I.	Tr.	In.
	7	39		I.	Sh.	Eg.
	7	49		I. *	Tr.	Eg.
	21	40	14.6	II.	Ec.	Dis.
14	0	31		II.	Oc.	Re.
	2	47	36.9	I.	Ec.	Dis.
	5	6		I.	Oc.	Re.
	23	55		I.	Sh.	In.
15	0	4		I.	Tr.	In.
	2	7		I.	Sh.	Eg.
	2	15		I.	Tr.	Eg.
	7	44	28.5	III.	Ec.	Dis.
	9	51		III. *	Oc.	Re.
	16	34		II. *	Sh.	In.
	16	51		II. *	Tr.	In.
	19	10		II.	Sh.	Eg.
	19	22		II.	Tr.	Eg.
	21	16	2.6	I.	Ec.	Dis.
	23	32		I.	Oc.	Re.
16	18	24		I.	Sh.	In.
	18	30		I.	Tr.	In.
	20	36		I.	Sh.	Eg.
	20	41		I.	Tr.	Eg.
17	10	57	51.3	II. *	Ec.	Dis.
	13	38		II. *	Oc.	Re.
	15	44	27.2	I. *	Ec.	Dis.
	17	58		I.	Oc.	Re.
18	12	52		I. *	Sh.	In.
	12	56		I. *	Tr.	In.
	15	4		I. *	Sh.	Eg.
	15	7		I. *	Tr.	Eg.
	21	24		III.	Sh.	In.
	21	53		III.	Tr.	In.
	23	18		III.	Tr.	Eg.
	23	26		III.	Sh.	Eg.
19	5	51		II.	Sh.	In.
	5	58		II.	Tr.	In.
	8	27		II. *	Sh.	Eg.
	8	29		II. *	Tr.	Eg.
	10	12	55.7	I. *	Ec.	Dis.
	12	24		I. *	Oc.	Re.
20	7	21		I. *	Sh.	In.
	7	22		I. *	Tr.	In.
	9	33		I. *	Sh.	Eg.
	9	33		I. *	Tr.	Eg.
21	0	16		II.	Oc.	Dis.
21	2	47	41.1	II.	Ec.	Re.
	4	39		I.	Oc.	Dis.
	6	48	56.0	I.	Ec.	Re.
22	1	48		I.	Tr.	In.
	1	49		I.	Sh.	In.
	4	0		I.	Tr.	Eg.
	4	1		I.	Sh.	Eg.
	11	42		III. *	Oc.	Dis.
	13	29	15.0	III. *	Ec.	Re.
	19	4		II.	Tr.	In.
	19	8		II.	Sh.	In.
	21	35		II.	Tr.	Eg.
	21	43		II.	Sh.	Eg.
	23	5		I.	Oc.	Dis.
23	1	17	22.1	I.	Ec.	Re.
	20	14		I.	Tr.	In.
	20	18		I.	Sh.	In.
	22	26		I.	Tr.	Eg.
	22	30		I.	Sh.	Eg.
24	13	23		II. *	Oc.	Dis.
	16	5	18.2	II. *	Ec.	Re.
	17	31		I.	Oc.	Dis.
	19	45	47.4	I.	Ec.	Re.
25	14	40		I. *	Tr.	In.
	14	46		I. *	Sh.	In.
	16	52		I.	Tr.	Eg.
	16	59		I.	Sh.	Eg.
26	1	7		III.	Tr.	In.
	1	23		III.	Sh.	In.
	2	37		III.	Tr.	Eg.
	3	23		III.	Sh.	Eg.
	8	11		II. *	Tr.	In.
	8	25		II. *	Sh.	In.
	10	42		II. *	Tr.	Eg.
	11	0		II. *	Sh.	Eg.
	11	56		I. *	Oc.	Dis.
	14	14	16.3	I. *	Ec.	Re.
27	9	6		I. *	Tr.	In.
	9	15		I. *	Sh.	In.
	11	18		I. *	Tr.	Eg.
	11	27		I. *	Sh.	Eg.
28	2	31		II.	Oc.	Dis.
	5	23	59.2	II.	Ec.	Re.
	6	22		I.	Oc.	Dis.
	8	42	43.3	I. *	Ec.	Re.
29	3	32		I.	Tr.	In.
	3	43		I.	Sh.	In.
	5	44		I.	Tr.	Eg.
	5	56		I.	Sh.	Eg.
	14	57		III. *	Oc.	Dis.
	17	27	23.9	III.	Ec.	Re.
	21	17		II.	Tr.	In.
	21	42		II.	Sh.	In.
	23	48		II.	Tr.	Eg.
30	0	17		II.	Sh.	Eg.
	0	48		I.	Oc.	Dis.
	3	11	11.0	I.	Ec.	Re.
	21	58		I.	Tr.	In.
	22	12		I.	Sh.	In.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow: * Visible at Washington.

WASHINGTON MEAN TIME.

APRIL.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 12h 30m for an Inverting Telescope.

Day.	West.		East.
1	O 2· ·1	O	·3 ·4
2	·2	O	1· ·3 ·4
3		O	·2 3· ·4 ·1 ●
4	1·	O	3· 2· ·4
5	3· 2·	O	·1 4·
6	·3 2 1·	O	4·
7	·3	O	·1 ·2 4·
8	·1	O	2· 3 4·
9	2· 4·	O	1· ·3
10	4· ·1	O	·2 3·
11	O 1· 4·	O	3· 2·
12	4· 3· 2·	O	·1
13	·4 3· 2 1·	O	
14	·4 ·3	O	·1 ·2
15	·4 ·1	O	3 2·
16	2· ·4	O	1· ·3
17	·1	O	·4 3· ·2 ●
18	1	O	· 3· 2· ·4
19	3· 2·	O	·1 ·4
20	·3 ·2 1·	O	·4
21	·3	O	·1 ·2 4·
22	1·	O	2· 4· ·3 ●
23	2·	O	1· ·3 4·
24	·1 ·	O	2 4· 3·
25	4	O	1· 3· 2·
26	4· 3· 2·	O	·1 ●
27	4· 3· ·2 1·	O	
28	4· ·3	O	·1 ·2
29	4· 1· ·	O	3 2·
30	·4 2·	O	·1 ·3

WASHINGTON MEAN TIME.

MAY.

d	h	m	s			
1	0	10		I.	Tr.	Eg.
	0	25		I.	Sh.	Eg.
	15	39		II.*	Oc.	Dis.
	18	41	41.3	II.	Ec.	Re.
	19	14		I.	Oc.	Dis.
	21	39	38.2	I.	Ec.	Re.
2	16	24		I.	Tr.	In.
	16	40		I.	Sh.	In.
	18	37		I.	Tr.	Eg.
	18	53		I.	Sh.	Eg.
3	4	22		III.	Tr.	In.
	5	21		III.	Sh.	In.
	5	57		III.	Tr.	Eg.
	7	21		III.	Sh.	Eg.
	10	24		II.*	Tr.	In.
	10	59		II.*	Sh.	In.
	12	55		II.*	Tr.	Eg.
	13	34		II.*	Sh.	Eg.
	13	40		I.*	Oc.	Dis.
	16	8	8.3	I.	Ec.	Re.
4	10	50		I.*	Tr.	In.
	11	9		I.*	Sh.	In.
	13	3		I.*	Tr.	Eg.
	13	22		I.*	Sh.	Eg.
5	4	47		II.	Oc.	Dis.
	8	0	29.4	II.*	Ec.	Re.
	8	6		I.*	Oc.	Dis.
	10	36	37.3	I.*	Ec.	Re.
6	5	17		I.	Tr.	In.
	5	38		I.	Sh.	In.
	7	29		I.	Tr.	Eg.
	7	51		I.*	Sh.	Eg.
	18	12		III.	Oc.	Dis.
	21	25	9 5	III.	Ec.	Re.
	23	31		II.	Tr.	In.
7	0	16		II.	Sh.	In.
	2	2		II.	Tr.	Eg.
	2	32		I.	Oc.	Dis.
	2	51		II.	Sh.	Eg.
	5	5	6.5	I.	Ec.	Re.
	23	43		I.	Tr.	In.
8	0	6		I.	Sh.	In.
	1	55		I.	Tr.	Eg.
	2	19		I.	Sh.	Eg.
	17	55		II.	Oc.	Dis.
	20	59		I.	Oc.	Dis.
	21	18	16.9	II.	Ec.	Re.
	23	33	35.4	I.	Ec.	Re.
9	18	9		I.	Tr.	In.
	18	35		I.	Sh.	In.
	20	21		I.	Tr.	Eg.
	20	48		I.	Sh.	Eg.
10	7	39		III.*	Tr.	In.
	9	19		III.*	Tr.	Eg.
	9	20		III.*	Sh.	In.
	11	19		III.*	Sh.	Eg.
	12	38		II.*	Tr.	In.
	13	33		II.*	Sh.	In.
	15	10		II.*	Tr.	Eg.
	15	25		I.*	Oc.	Re.
	16	8		II.	Sh.	Eg.
	18	2	7.0	I.	Ec.	Re.
11	12	36		I.*	Tr.	In.
	13	4		I.*	Sh.	In.
	14	47		I.*	Tr.	Eg.
11	15	17		I.*	Sh.	Eg.
12	7	4		II.	Oc.	Dis.
	9	51		I.*	Oc.	Dis.
	10	37	11.6	II.*	Ec.	Re.
	12	30	37.6	I.*	Ec.	Re.
13	7	2		I.	Tr.	In.
	7	32		I.	Sh.	In.
	9	14		I.*	Tr.	Eg.
	9	45		I.*	Sh.	Eg.
	21	30		III.	Oc.	Dis.
	23	12		III.	Oc.	Re.
	23	39	30.8	III.	Ec.	Dis.
14	1	23	12.6	III.	Ec.	Re.
	1	45		II.	Tr.	In.
	2	50		II.	Sh.	In.
	4	17		II.	Tr.	Eg.
	4	17		I.	Oc.	Dis.
	5	25		II.	Sh.	Eg.
	6	59	8.6	I.	Ec.	Re.
15	1	28		I.	Tr.	In.
	2	1		I.	Sh.	In.
	3	40		I.	Tr.	Eg.
	4	14		I.	Sh.	Eg.
	20	13		II.	Oc.	Dis.
	22	43		I.	Oc.	Dis.
	23	55	3.4	II.	Ec.	Re.
16	1	27	39.2	I.	Ec.	Re.
	19	55		I.	Tr.	In.
	20	30		I.	Sh.	In.
	22	7		I.	Tr.	Eg.
	22	43		I.	Sh.	Eg.
17	10	58		III.*	Tr.	In.
	12	43		III.*	Tr.	Eg.
	13	19		III.*	Sh.	In.
	14	52		II.*	Tr.	In.
	15	17		III.	Sh.	Eg.
	16	7		II.	Sh.	In.
	17	10		I.	Oc.	Dis.
	17	25		II.	Tr.	Eg.
	18	42		II.	Sh.	Eg.
	19	56	12.1	I.	Ec.	Dis.
18	14	21		I.*	Tr.	In.
	14	59		I.	Sh.	In.
	16	33		I.	Tr.	Eg.
	17	11		I.	Sh.	Eg.
19	9	22		II.*	Oc.	Dis.
	11	36		I.*	Oc.	Dis.
	13	14	3.6	II.*	Ec.	Re.
	14	24	44.7	I.*	Ec.	Re.
20	8	47		I.*	Tr.	In.
	9	28		I.*	Sh.	In.
	11	0		I.*	Tr.	Eg.
	11	40		I.*	Sh.	Eg.
21	0	50		III.	Oc.	Dis.
	2	37		III.	Oc.	Re.
	3	38	3.4	III.	Ec.	Dis.
	4	0		II.	Tr.	In.
	5	20	52.4	III.	Ec.	Re.
	5	24		II.	Sh.	In.
	6	2		I.	Oc.	Dis.
	6	34		II.	Tr.	Eg.
	7	59		II.*	Sh.	Eg.
	8	53	16.9	I.*	Ec.	Re.
22	3	14		I.	Tr.	In.
	3	57		I.	Sh.	In.
22	5	26		I.	Tr.	Eg.
	6	9		I.	Sh.	Eg.
	22	32		I.	Oc.	Dis.
23	0	29		I.	Oc.	Dis.
	2	31	59.5	II.	Ec.	Re.
	3	21	49.1	I.	Ec.	Re.
	21	40		I.	Tr.	In.
	22	25		I.	Sh.	In.
	23	53		I.	Tr.	Eg.
24	0	37		I.	Sh.	Eg.
	14	21		III.*	Tr.	In.
	16	11		III.	Tr.	Eg.
	17	9		II.	Tr.	In.
	17	19		III.	Sh.	In.
	18	41		II.	Sh.	In.
	18	55		I.	Oc.	Dis.
	19	16		III.	Sh.	Eg.
	19	43		II.	Tr.	Eg.
	21	16		II.	Sh.	Eg.
	21	50	23.2	I.	Ec.	Re.
25	16	7		I.	Tr.	In.
	16	54		I.	Sh.	In.
	18	19		I.	Tr.	Eg.
	19	6		I.	Sh.	Eg.
26	11	42		II.*	Oc.	Dis.
	13	22		I.*	Oc.	Dis.
	15	51	4.1	II.	Ec.	Re.
	16	18	57.6	I.	Ec.	Re.
27	10	34		I.*	Tr.	In.
	11	23		I.*	Sh.	In.
	12	46		I.*	Tr.	Eg.
	13	35		I.*	Sh.	Eg.
28	4	13		III.	Oc.	Dis.
	6	5		III.	Oc.	Re.
	6	18		II.	Tr.	In.
	7	36	36.7	III.	Ec.	Dis.
	7	49		I.	Oc.	Dis.
	7	58		II.	Sh.	In.
	8	52		II.*	Tr.	Eg.
	9	18	34.1	III.*	Ec.	Re.
	10	33		II.*	Sh.	Eg.
	10	47	30.9	I.*	Ec.	Re.
29	5	1		I.	Tr.	In.
	5	51		I.	Sh.	In.
	7	13		I.	Tr.	Eg.
	8	3		I.*	Sh.	Eg.
30	0	53		II.	Oc.	Dis.
	2	15		I.	Oc.	Dis.
	5	9	3.1	II.	Ec.	Re.
	5	16	4.7	I.	Ec.	Re.
	23	28		I.	Tr.	In.
31	0	20		I.	Sh.	In.
	1	40		I.	Tr.	Eg.
	2	32		I.	Sh.	Eg.
	17	47		III.	Tr.	In.
	19	27		II.	Tr.	In.
	19	41		III.	Tr.	Eg.
	20	42		I.	Oc.	Dis.
	21	15		II.	Sh.	In.
	21	19		III.	Sh.	In.
	22	2		II.	Tr.	Eg.
	23	15		III.	Sh.	Eg.
	23	44	39.9	I.	Ec.	Re.
	23	50		II.	Sh.	Eg.

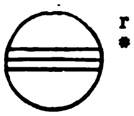
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME

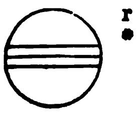
MAY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

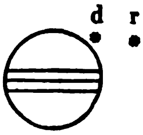
I.



II.



III.



Configurations at 11h 30m for an Inverting Telescope.

Day.	West.	East.
1	·4 ·1 ·2	3·
2	·4	1· 3· 2
3	○ 2· 4 3· ·1	
4	○ 1· 3· ·2	·4
5	·3	·1 ·2 ·4
6	1· 3	2· ·4
7	2·	·1 ·3 ·4
8	·1 2	·3 4·
9		1· 2 3· 4·
10	·1 3·	2· 4·
11	3· ·2	1· 4·
12	·3 4·	·2 ·1 ●
13	4· ·3 1·	2·
14	4· 2·	·1 ·3
15	4· 2 1·	·3
16	·4	1· ·2 3·
17	○ 3· ·4 ·1	2·
18	·4 3· 2·	1·
19	·3 ·4 ·	1 ·2 ●
20	·3 1·	·4 2·
21	2·	·1 ·3 ·4
22	·2 1·	·3 ·4
23		·1 ·2 3· ·4
24	·1	3· 2· ·4
25	3· 2·	1· 4·
26	·3 ·1 ·	2 4·
27	○ 1· ·3	2· 4·
28	2·	·1 4· 3
29	2 4· 1·	·3
30	4·	·1 2 3·
31	4· ·1	3· 2·

WASHINGTON MEAN TIME.

JUNE.

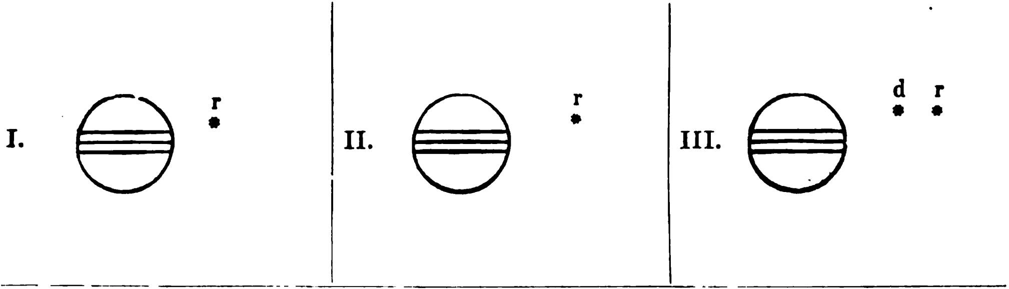
d	h	m	s			
1	17	55		I.	Tr.	In.
	18	49		I.	Sh.	In.
	20	7		I.	Tr.	Eg.
	21	1		I.	Sh.	Eg.
2	14	4		II.	Oc.	Dis.
	15	9		I.	Oc.	Dis.
	18	13	15.7	I.	Ec.	Re.
	18	28	11.2	II.	Ec.	Re.
3	12	22		I.*	Tr.	In.
	13	17		I.*	Sh.	In.
	14	34		I.	Tr.	Eg.
	15	29		I.	Sh.	Eg.
4	7	41		III.	Oc.	Dis.
	8	37		II.*	Tr.	In.
	9	36		I.*	Oc.	Dis.
	9	37		III.*	Oc.	Re.
	10	32		II.*	Sh.	In.
	11	12		II.*	Tr.	Eg.
	11	35	28.8	III.*	Ec.	Dis.
	12	41	50.4	I.*	Ec.	Re.
	13	7		II.*	Sh.	Eg.
	13	16	36.0	III.*	Ec.	Re.
5	6	49		I.	Tr.	In.
	7	46		I.	Sh.	In.
	9	1		I.*	Tr.	Eg.
	9	58		I.*	Sh.	Eg.
6	3	16		II.	Oc.	Dis.
	4	3		I.	Oc.	Dis.
	7	10	25.5	I.	Ec.	Re.
	7	46	12.9	II.	Ec.	Re.
7	1	17		I.	Tr.	In.
	2	15		I.	Sh.	In.
	3	29		I.	Tr.	Eg.
	4	27		I.	Sh.	Eg.
	21	17		III.	Tr.	In.
	21	48		II.	Tr.	In.
	22	30		I.	Oc.	Dis.
	23	16		III.	Tr.	Eg.
	23	49		II.	Sh.	In.
8	0	23		II.	Tr.	Eg.
	1	18		III.	Sh.	In.
	1	39	2.0	I.	Ec.	Re.
	2	24		II.	Sh.	Eg.
	3	14		III.	Sh.	Eg.
	19	44		I.	Tr.	In.
	20	44		I.	Sh.	In.
	21	56		I.	Tr.	Eg.
	22	56		I.	Sh.	Eg.
9	16	28		II.	Oc.	Dis.
	16	57		I.	Oc.	Dis.
	20	7	39.2	I.	Ec.	Re.
	21	5	23.0	II.	Ec.	Re.
10	14	12		I.	Tr.	In.
	15	13		I.	Sh.	In.
	16	23		I.	Tr.	Eg.
	17	25		I.	Sh.	Eg.
11	10	59		II.*	Tr.	In.
	11	13		III.*	Oc.	Dis.
	11	24		I.*	Oc.	Dis.
	13	6		II.*	Sh.	In.
	13	13		III.*	Oc.	Re.
11	13	33		II.	Tr.	Eg.
	14	36	14.9	I.	Ec.	Re.
	15	34	29.5	III.	Ec.	Dis.
	15	41		II.	Sh.	Eg.
	17	14	48.1	III.	Ec.	Re.
12	8	39		I.*	Tr.	In.
	9	42		I.*	Sh.	In.
	10	51		I.*	Tr.	Eg.
	11	54		I.*	Sh.	Eg.
13	5	41		II.	Oc.	Dis.
	5	51		I.	Oc.	Dis.
	9	4	51.1	I.*	Ec.	Re.
	10	23	27.1	II.*	Ec.	Re.
14	3	7		I.	Tr.	In.
	4	11		I.	Sh.	In.
	5	19		I.	Tr.	Eg.
	6	22		I.	Sh.	Eg.
15	0	11		II.	Tr.	In.
	0	19		I.	Oc.	Dis.
	0	52		III.	Tr.	In.
	2	24		II.	Sh.	In.
	2	47		II.	Tr.	Eg.
	2	55		III.	Tr.	Eg.
	3	33	28.6	I.	Ec.	Re.
	4	59		II.	Sh.	Eg.
	5	17		III.	Sh.	In.
	7	12		III.	Sh.	Eg.
	21	34		I.	Tr.	In.
	22	40		I.	Sh.	In.
	23	47		I.	Tr.	Eg.
16	0	51		I.	Sh.	Eg.
	18	46		I.	Oc.	Dis.
	18	55		II.	Oc.	Dis.
	22	2	6.8	I.	Ec.	Re.
	23	42	38.4	II.	Ec.	Re.
17	16	2		I.	Tr.	In.
	17	8		I.	Sh.	In.
	18	14		I.	Tr.	Eg.
	19	20		I.	Sh.	Eg.
18	13	14		I.	Oc.	Dis.
	13	23		II.	Tr.	In.
	14	50		III.	Oc.	Dis.
	15	41		II.	Sh.	In.
	16	0		II.	Tr.	Eg.
	16	30	43.5	I.	Ec.	Re.
	16	55		III.	Oc.	Re.
	18	16		II.	Sh.	Eg.
	19	34	11.7	III.	Ec.	Dis.
	21	13	43.1	III.	Ec.	Re.
19	10	29		I.*	Tr.	In.
	11	37		I.*	Sh.	In.
	12	42		I.	Tr.	Eg.
	13	49		I.	Sh.	Eg.
20	7	41		I.	Oc.	Dis.
	8	8		II.	Oc.	Dis.
	10	59	21.0	I.*	Ec.	Re.
	13	0	44.0	II.	Ec.	Re.
21	4	57		I.	Tr.	In.
	6	6		I.	Sh.	In.
	7	10		I.	Tr.	Eg.
	8	18		I.*	Sh.	Eg.
22	2	9		I.	Oc.	Dis.
	2	36		II.	Tr.	In.
	4	31		III.	Tr.	In.
	4	58		II.	Sh.	In.
	5	13		II.	Tr.	Eg.
	5	27	59.1	I.	Ec.	Re.
	6	37		III.	Tr.	Eg.
	7	33		II.	Sh.	Eg.
	9	17		III.*	Sh.	In.
	11	11		III.*	Sh.	Eg.
	23	24		I.	Tr.	In.
23	0	34		I.	Sh.	In.
	1	37		I.	Tr.	Eg.
	2	47		I.	Sh.	Eg.
	20	37		I.	Oc.	Dis.
	21	23		II.	Oc.	Dis.
	23	56	38.8	I.	Ec.	Re.
24	2	19	55.6	II.	Ec.	Re.
	17	52		I.	Tr.	In.
	19	2		I.	Sh.	In.
	20	5		I.	Tr.	Eg.
	21	15		I.	Sh.	Eg.
25	15	4		I.	Oc.	Dis
	15	50		II.	Tr.	In.
	18	15		II.	Sh.	In.
	18	25	16.2	I.	Ec.	Re.
	18	27		II.	Tr.	Eg.
	18	31		III.	Oc.	Dis.
	20	39		III.	Oc.	Re.
	20	50		II.	Sh.	Eg.
	23	33	25.0	III.	Ec.	Dis.
26	1	12	10.6	III.	Ec.	Re.
	12	20		I.	Tr.	In.
	13	31		I.	Sh.	In.
	14	33		I.	Tr.	Eg.
	15	44		I.	Sh.	Eg.
27	9	32		I.*	Oc.	Dis.
	10	38		II.*	Oc.	Dis.
	12	53	54.3	I.	Ec.	Re.
	15	38	1.8	II.	Ec.	Re.
28	6	48		I.	Tr.	In.
	8	0		I.	Sh.	In.
	9	1		I.*	Tr.	Eg.
	10	13		I.*	Sh.	Eg.
29	4	0		I.	Oc.	Dis.
	5	4		II.	Tr.	In.
	7	22	33.1	I.	Ec.	Re.
	7	33		II.	Sh.	In.
	7	41		II.	Tr.	Eg.
	8	15		III.*	Tr.	In.
	10	7		II.*	Sh.	Eg.
	10	24		III.*	Tr.	Eg.
	13	16		III.	Sh.	In.
	15	10		III.	Tr.	Eg.
30	1	16		I.	Tr.	In.
	2	29		I.	Sh.	In.
	3	29		I.	Tr.	Eg.
	4	41		I.	Sh.	Eg.
	22	28		I.	Oc.	Dis.
	23	54		II.	Oc.	Dis.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse. Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow: * Visible at Washington.

WASHINGTON MEAN TIME.

JUNE.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 10h 30m for an Inverting Telescope.

Day.	West.		East.
1	4· 2· 3·	○	1·
2	·4 3· ·1 2	○	
3	·4 ·3	○	1· ·2
4	○ 2· ·4	○	·3 ·1 ●
5	·2 ·4 1·	○	·3
6		○	·4 ·2 ·1 3·
7	1·	○	3· 2· ·4
8	2· 3·	○	1· ·4
9	3· ·2 ·1	○	·4
10	·3	○	1· ·2 4·
11	·1	○	2· 4· ·3 ●
12	○ 1· ·2	○	·3 4·
13		○	·2 ·1 4· 3·
14	1· 4	○	2· 3·
15	4· 2· 3·	○	·1
16	4· 3· ·2 ·1	○	
17	4· ·3	○	1· ·2
18	4· ·3 ·1	○	2·
19	○ 1· ·4 2·	○	·3
20	·4	○	·1 ·3 ·2 ●
21	·4 1·	○	2· 3·
22	2· ·4 3·	○	·1
23	3· ·2 1·	○	·4
24	·3	○	1· ·2 ·4
25	·3 ·1	○	2· ·4
26	2·	○	1· ·3 ·4
27	·	○	2 ·3 4· ·1 ●
28	1·	○	2· 3· 4·
29	○ 3·· 2·	○	·1 4·
30	3· ·2 1·	○	4·

WASHINGTON MEAN TIME.

JULY.

d	h	m	s			
1	1	51	13.9	I.	Ec.	Re.
	4	57	12.4	II.	Ec.	Re.
	19	44		I.	Tr.	In.
	20	58		I.	Sh.	In.
	21	57		I.	Tr.	Eg.
	23	10		I.	Sh.	Eg.
2	16	56		I.	Oc.	Dis.
	18	19		II.	Tr.	In.
	20	19	52.1	I.	Ec.	Re.
	20	50		II.	Sh.	In.
	20	56		II.	Tr.	Eg.
	22	18		III.	Oc.	Dis.
	23	24		II.	Sh.	Eg.
3	0	28		III.	Oc.	Re.
	3	32	49.9	III.	Ec.	Dis.
	5	10	51.1	III.	Ec.	Re.
	14	13		I.	Tr.	In.
	15	27		I.	Sh.	In.
	16	26		I.	Tr.	Eg.
	17	39		I.	Sh.	Eg.
4	11	24		I.	* Oc.	Dis.
	13	10		II.	Oc.	Dis.
	14	48	30.9	I.	Ec.	Re.
	18	15	19.2	II.	Ec.	Re.
5	8	41		I.	* Tr.	In.
	9	55		I.	* Sh.	In.
	10	54		I.	* Tr.	Eg.
	12	7		I.	Sh.	Eg.
6	5	52		I.	Oc.	Dis.
	7	34		II.	Tr.	In.
	9	17	10.2	I.	* Ec.	Re.
	10	8		II.	* Sh.	In.
	10	11		II.	* Tr.	Eg.
	12	4		III.	Tr.	In.
	12	41		II.	Sh.	Eg.
	14	15		III.	Tr.	Eg.
	17	15		III.	Sh.	In.
	19	8		III.	Sh.	Eg.
7	3	9		I.	Tr.	In.
	4	24		I.	Sh.	In.
	5	23		I.	Tr.	Eg.
	6	36		I.	Sh.	Eg.
8	0	20		I.	Oc.	Dis.
	2	27		II.	Oc.	Dis.
	3	45	51.7	I.	Ec.	Re.
	7	34	28.0	II.	Ec.	Re.
	21	38		I.	Tr.	In.
	22	53		I.	Sh.	In.
	23	51		I.	Tr.	Eg.
9	1	5		I.	Sh.	Eg.
	18	49		I.	Oc.	Dis.
	20	50		II.	Tr.	In.
	22	14	30.1	I.	Ec.	Re.
	23	25		II.	Sh.	In.
	23	27		II.	Tr.	Eg.
10	1	58		II.	Sh.	Eg.
	2	8		III.	Oc.	Dis.
	4	21		III.	Oc.	Re.
	7	31	47.2	III.	Ec.	Dis.
	9	9	5.7	III.	* Ec.	Re.
	16	6		I.	Tr.	In.
	17	22		I.	Sh.	In.
	18	20		I.	Tr.	Eg.
	19	34		I.	Sh.	Eg.
11	13	17		I.	Oc.	Dis.
11	15	44		II.	Oc.	Dis.
	16	43	10.2	I.	Ec.	Re.
	20	52	34.4	II.	Ec.	Re.
12	10	34		I.	* Tr.	In.
	11	51		I.	Sh.	In.
	12	48		I.	Tr.	Eg.
	14	3		I.	Sh.	Eg.
13	7	46		I.	Oc.	Dis.
	10	6		II.	* Tr.	In.
	11	11	49.4	I.	Ec.	Re.
	12	43		II.	Sh.	In.
	12	44		II.	Tr.	Eg.
	15	16		II.	Sh.	Eg.
	15	58		III.	Tr.	In.
	18	11		III.	Tr.	Eg.
	21	16		III.	Sh.	In.
	23	8		III.	Sh.	Eg.
14	5	3		I.	Tr.	In.
	6	20		I.	Sh.	In.
	7	17		I.	Tr.	Eg.
	8	32		I.	* Sh.	Eg.
15	2	14		I.	Oc.	Dis.
	5	3		II.	Oc.	Dis.
	5	40	31.5	I.	Ec.	Re.
	10	11	40.1	II.	* Ec.	Re.
	23	31		I.	Tr.	In.
16	0	48		I.	Sh.	In.
	1	45		I.	Tr.	Eg.
	3	0		I.	Sh.	Eg.
	20	43		I.	Oc.	Dis.
	23	23		II.	Tr.	In.
17	0	9	10.2	I.	Ec.	Re.
	2	0		II.	Sh.	In.
	2	1		II.	Tr.	Eg.
	4	33		II.	Sh.	Eg.
	6	3		III.	Oc.	Dis.
	8	17		III.	* Oc.	Re.
	11	30	41.6	III.	Ec.	Dis.
	13	7	18.6	III.	Ec.	Re.
	18	0		I.	Tr.	In.
	19	17		I.	Sh.	In.
	20	14		I.	Tr.	Eg.
	21	29		I.	Sh.	Eg.
18	15	11		I.	Oc.	Dis.
	18	21		II.	Oc.	Dis.
	18	37	50.7	I.	Ec.	Re.
	23	29	45.6	II.	Ec.	Re.
19	12	29		I.	Tr.	In.
	13	46		I.	Sh.	In.
	14	43		I.	Tr.	Eg.
	15	58		I.	Sh.	Eg.
20	9	40		I.	* Oc.	Dis.
	12	40		II.	Tr.	In.
	13	6	30.3	I.	Ec.	Re.
	15	18		II.	Sh.	In.
	15	18		II.	Tr.	Eg.
	17	51		II.	Sh.	Eg.
	19	55		III.	Tr.	In.
	22	10		III.	Tr.	Eg.
21	1	15		III.	Sh.	In.
	3	7		III.	Sh.	Eg.
	6	58		I.	Tr.	In.
	8	15		I.	* Sh.	In.
	9	12		I.	* Tr.	Eg.
	10	27		I.	* Sh.	Eg.
22	4	9		I.	Oc.	Dis.
	7	35	13.2	I.	Ec.	Re.
	7	40		II.	Oc.	Dis.
	12	48	47.5	II.	Ec.	Re.
23	1	27		I.	Tr.	In.
	2	44		I.	Sh.	In.
	3	41		I.	Tr.	Eg.
	4	56		I.	Sh.	Eg.
	22	38		I.	Oc.	Dis.
24	1	58		II.	Tr.	In.
	2	3	52.2	I.	Ec.	Re.
	4	35		II.	Sh.	In.
	4	36		II.	Tr.	Eg.
	7	8		II.	Sh.	Eg.
	10	2		III.	* Oc.	Dis.
	12	17		III.	Oc.	Re.
	15	29	51.5	III.	Ec.	Dis.
	17	5	48.7	III.	Ec.	Re.
	19	56		I.	Tr.	In.
	21	13		I.	Sh.	In.
	22	10		I.	Tr.	Eg.
	23	25		I.	Sh.	Eg.
25	17	6		I.	Oc.	Dis.
	20	32	33.2	I.	Ec.	Re.
	20	59		II.	Oc.	Dis.
26	2	6	51.9	II.	Ec.	Re.
	14	25		I.	Tr.	In.
	15	41		I.	Sh.	In.
	16	39		I.	Tr.	Eg.
	17	53		I.	Sh.	Eg.
27	11	35		I.	Oc.	Dis.
	15	1	13.1	I.	Ec.	Re.
	15	16		II.	Tr.	In.
	17	53		II.	Sh.	In.
	17	55		II.	Tr.	Eg.
	20	26		II.	Sh.	Eg.
	23	57		III.	Tr.	In.
28	2	12		III.	Tr.	Eg.
	5	15		III.	Sh.	In.
	7	6		III.	Sh.	Eg.
	8	54		I.	* Tr.	In.
	10	10		I.	* Sh.	In.
	11	8		I.	Tr.	Eg.
	12	22		I.	Sh.	Eg.
29	6	4		I.	Oc.	Dis.
	9	29	56.0	I.	* Ec.	Re.
	10	19		II.	Oc.	Dis.
	15	25	49.4	II.	Ec.	Re.
30	3	23		I.	Tr.	In.
	4	39		I.	Sh.	In.
	5	37		I.	Tr.	Eg.
	6	51		I.	Sh.	Eg.
31	0	33		I.	Oc.	Dis.
	3	58	35.4	I.	Ec.	Re.
	4	35		II.	Tr.	In.
	7	10		II.	Sh.	In.
	7	14		II.	Tr.	Eg.
	9	43		II.	* Sh.	Eg.
	14	5		III.	Oc.	Dis.
	16	21		III.	Oc.	Re.
	19	29	4.6	III.	Ec.	Dis.
	21	4	23.8	III.	Ec.	Re.
	21	52		I.	Tr.	In.
	23	8		I.	Sh.	In.

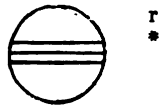
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME

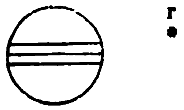
JULY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

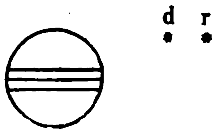
I.



II.



III.



Configurations at 9h 30m for an Inverting Telescope.

Day.	West.		East.
1	·3 4·	○	2 ·1
2	4· ·3 ·1	○	2·
3	4· 2·	○	1· ·3
4	4· 2 ·1	○	·3
5	○ 1· ·4	○	·2 3·
6	○ 2· ·4 3	○	··1 ·
7	·4 3· ·2 1·	○	
8	·3 ·4	○	·2 ·1
9	·3 ·1	.4 ○	2·
10	2·	○	3 1· ·4
11	2 ·1	○	·3 ·4
12	1	○	· ·2 3· ·4
13	2	○	· 3· ·4 ·1 ●
14	2 3· 1·	○	4·
15	3·	○	·2 ·1 4·
16	·3 1·	○	2· 4·
17	2·	○	·3 4· 1·
18	2 4· ·1	○	·3
19	4·	○	1· ·2 3·
20	4· ·	○	12· 3·
21	4· 2· 3· 1·	○	
22	·4 3·	○	·1 ·2 ●
23	·4 ·3 1·	○	2·
24	·4 2·	○	·1 ·3 ●
25	· 4 ·2 ·1	○	·3
26		○	·4 1· ·2 3·
27	·1	○	2· 3· ·4
28	○ 1· 2· 3·	○	·4
29	3· ·	○	2 ·1 ·4
30	·3 1·	○	2· ·4
31	3 2·	○	·1 4·

WASHINGTON MEAN TIME.

AUGUST.

d	h	m	s			
1	0	6		I.	Tr.	Eg.
	1	20		I.	Sh.	Eg.
	19	2		I.	Oc.	Dis.
	22	27	16.6	I.	Ec.	Re.
	23	39		II.	Oc.	Dis.
2	4	43	51.4	II.	Ec.	Re.
	16	21		I.	Tr.	In.
	17	37		I.	Sh.	In.
	18	35		I.	Tr.	Eg.
	19	49		I.	Sh.	Eg.
3	13	31		I.	Oc.	Dis
	16	55	56.2	I.	Ec.	Re.
	17	54		II.	Tr.	In.
	20	28		II..	Sh.	In.
	20	33		II.	Tr.	Eg.
	23	1		II.	Sh.	Eg.
4	4	2		III.	Tr.	In.
	6	18		III.	Tr.	Eg.
	9	14		III. *	Sh.	In.
	10	51		I.	Tr.	In.
	11	5		III.	Sh.	Eg.
	12	6		I.	Sh.	In.
	13	4		I.	Tr.	Eg.
	14	18		I.	Sh.	Eg.
5	8	0		I. *	Oc.	Dis.
	11	24	39.7	I.	Ec.	Re.
	13	0		II.	Oc.	Dis.
	18	2	42.9	II.	Ec.	Re.
6	5	20		I.	Tr.	In.
	6	34		I.	Sh.	In.
	7	34		I.	Tr.	Eg.
	8	46		I. *	Sh.	Eg.
7	2	30		I.	Oc.	Dis.
	5	53	19.1	I.	Ec.	Re.
	7	14		II.	Tr.	In.
	9	45		II.	Sh.	In.
	9	53		II.	Tr.	Eg.
	12	18		II.	Sh.	Eg.
	18	13		III.	Oc.	Dis.
	20	29		III.	Oc.	Re.
	23	28	54.8	III.	Ec.	Dis.
	23	49		I.	Tr.	In.
8	1	3		I.	Sh.	In.
	1	3	37.6	III.	Ec.	Re.
	2	3		I.	Tr.	Eg.
	3	15		I.	Sh.	Eg.
	20	59		I.	Oc.	Dis.
9	0	22	0.4	I.	Ec.	Re.
	2	20		II.	Oc.	Dis.
	7	20	42.8	II.	Ec.	Re.
	18	19		I.	Tr.	In.
	19	32		I.	Sh.	In.
	20	33		I.	Tr.	Eg.
	21	44		I.	Sh.	Eg.
10	15	28		I.	Oc.	Dis.
	18	50	40.0	I.	Ec.	Re.
	20	35		II.	Tr.	In.
	23	3		II.	Sh.	In.
	23	13		II.	Tr.	Eg.
11	1	36		II.	Sh.	Eg.
	8	10		III. *	Tr.	In.
	10	26		III.	Tr.	Eg.
	12	48		I.	Tr.	In.

d	h	m	s			
11	13	13		III.	Sh.	In.
	14	0		I.	Sh.	In.
	15	2		I.	Tr.	Eg.
	15	4		III.	Sh.	Eg.
	16	12		I.	Sh.	Eg.
12	9	58		I.	Oc.	Dis.
	13	19	23.8	I.	Ec.	Re.
	15	42		II.	Oc.	Dis.
	20	39	28.3	II.	Ec.	Re.
13	7	17		I.	Tr.	In.
	8	29		I. *	Sh.	In.
	9	32		I.	Tr.	Eg.
	10	41		I.	Sh.	Eg.
14	4	27		I.	Oc.	Dis.
	7	48	2.9	I. *	Ec.	Re.
	9	55		II.	Tr.	In.
	12	20		II.	Sh.	In.
	12	33		II.	Tr.	Eg.
	14	53		II.	Sh.	Eg.
	22	22		III.	Oc.	Dis.
15	0	39		III.	Oc.	Re.
	1	47		I.	Tr.	In.
	2	58		I.	Sh.	In.
	3	28	11.0	III.	Ec.	Dis.
	4	1		I.	Tr.	Eg.
	5	2	19.2	III.	Ec.	Re.
	5	10		I.	Sh.	Eg.
	22	57		I.	Oc.	Dis.
16	2	16	44.5	I.	Ec.	Re.
	5	3		II.	Oc.	Dis.
	9	57	25.5	II.	Ec.	Re.
	20	16		I.	Tr.	In.
	21	26		I.	Sh.	In.
	22	30		I.	Tr.	Eg.
	23	38		I.	Sh.	Eg.
17	17	26		I.	Oc.	Dis.
	20	45	23.7	I.	Ec.	Re.
	23	16		II.	Tr.	In.
18	1	38		II.	Sh.	In.
	1	54		II.	Tr.	Eg.
	4	11		II.	Sh.	Eg.
	12	22		III.	Tr.	In.
	14	38		III.	Tr.	Eg.
	14	45		I.	Tr.	In.
	15	55		I.	Sh.	In.
	17	0		I.	Tr.	Eg.
	17	12		III.	Sh.	In.
	18	7		I.	Sh.	Eg.
	19	2		III.	Sh.	Eg.
19	11	56		I.	Oc.	Dis.
	15	14	7.4	I.	Ec.	Re.
	18	25		II.	Oc.	Dis.
	23	16	4.3	II.	Ec.	Re.
20	9	15		I.	Tr.	In.
	10	24		I.	Sh.	In.
	11	30		I.	Tr.	Eg.
	12	36		I.	Sh.	Eg.
21	6	25		I.	Oc.	Dis.
	9	42	46.6	I.	Ec.	Re.
	12	37		II.	Tr.	In.
	14	56		II.	Sh.	In.
	15	15		II.	Tr.	Eg.

d	h	m	s			
21	17	29		II.	Sh.	Eg.
22	2	36		III.	Oc.	Dis.
	3	45		I.	Tr.	In.
	4	52		III.	Oc.	Re.
	4	52		I.	Sh.	In.
	5	59		I.	Tr.	Eg.
	7	5		I.	Sh.	Eg.
	7	27	33.0	III. *	Ec.	Dis.
	9	1	8.4	III.	Ec.	Re.
23	0	55		I.	Oc.	Dis.
	4	11	28.3	I.	Ec.	Re.
	7	47		II. *	Oc.	Dis.
	12	33	58.2	II.	Ec.	Re.
	22	15		I.	Tr.	In.
	23	21		I.	Sh.	In.
24	0	29		I.	Tr.	Eg.
	1	34		I.	Sh.	Eg.
	19	24		I.	Oc.	Dis.
	22	40	6.9	I.	Ec.	Re.
25	1	59		II.	Tr.	In.
	4	14		II.	Sh.	In.
	4	37		II.	Tr.	Eg.
	6	47		II.	Sh.	Eg.
	16	36		III.	Tr.	In.
	16	45		I.	Tr.	In.
	17	51		I.	Sh.	In.
	18	53		III.	Tr.	Eg.
	18	59		I.	Tr.	Eg.
	20	3		I.	Sh.	Eg.
	21	12		III.	Sh.	In.
	23	1		III.	Sh.	Eg.
26	13	54		I.	Oc.	Dis.
	17	8	50.6	I.	Ec.	Re.
	21	10		II.	Oc.	Dis.
27	1	52	29.3	II.	Ec.	Re.
	11	14		I.	Tr.	In.
	12	19		I.	Sh.	In.
	13	28		I.	Tr.	Eg.
	14	31		I.	Sh.	Eg.
28	8	24		I.	Oc.	Dis.
	11	37	29.4	I.	Ec.	Re.
	15	21		II.	Tr.	In.
	17	31		II.	Sh.	In.
	17	59		II.	Tr.	Eg.
	20	4		II.	Sh.	Eg.
29	5	44		I.	Tr.	In.
	6	48		I.	Sh.	In.
	6	51		III.	Oc.	Dis.
	7	58		I. *	Tr.	Eg.
	9	0		I.	Sh.	Eg.
	9	8		III.	Oc.	Re.
	11	26	25.0	III.	Ec.	Dis.
	12	59	29.4	III.	Ec.	Re.
30	2	53		I.	Oc.	Dis.
	6	6	11.0	I.	Ec.	Re.
	10	33		II.	Oc.	Dis.
	15	10	20 0	II.	Ec.	Re.
31	0	14		I.	Tr.	In.
	1	17		I.	Sh.	In.
	2	28		I.	Tr.	Eg.
	3	29		I.	Sh.	Eg.
	21	23		I.	Oc.	Dis.

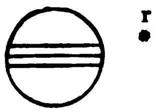
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse. Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow: * Visible at Washington.

WASHINGTON MEAN TIME.

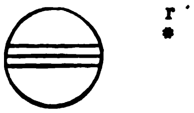
AUGUST.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

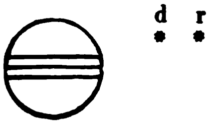
I.



II.



III.



Configurations at 8h 30m for an Inverting Telescope.

Day.	West.		East.
1	·2 1·	○	·3 4·
2		○	·2 1· 4· ·3
3	·1	○	4· 2· 3·
4	2· 4· 3·	○	1·
5	4· 3· ·2	○	·1 ●
6	4· ·3 1·	○	·2
7	○ 2· 4· ·3	○	·1
8	·4 ·2 1·	○	·3
9	·4	○	·2 ·1 ·3
10	·4 ·1	○	2· 3·
11	○ 3· ·4 2·	○	1·
12	3· ·2 ·1	○	·4
13	○ 1· ·3	○	·2 ·4
14	·3	○	·1 2· ·4
15	2· 1·	○	·3 ·4
16		○	·2 ·1 ·3 4·
17	·1	○	2· 3· 4·
18	2·	○	3· 1· 4·
19	3· ·2 ·1	○	4·
20	3· 1 4	○	· · ·2
21	3 4·	○	2· ·1 ●
22	4· 2· 1·	○	·3
23	4·	○	·1 ·3 ·2 ●
24	4· 1·	○	2· 3·
25	·4 2·	○	1· 3·
26	·4 ·2 3· ·1	○	
27	3· ·4	○	1· ·2
28	·3 ·4	○	2· ·1 ●
29	2· 1·	○	·4 ·3 ●
30	·2	○	·1 ·3 ·4
31	1·	○	·2 3· ·4

WASHINGTON MEAN TIME.

SEPTEMBER.

d	h	m	s			
1	0	34	49.5	I.	Ec.	Re.
	4	44		II.	Tr.	In.
	6	49		II.	Sh.	In.
	7	21		II. *	Tr.	Eg.
	9	22		II.	Sh.	Eg.
	18	44		I.	Tr.	In.
	19	45		I.	Sh.	In.
	20	54		III.	Tr.	In.
	20	58		I.	Tr.	Eg.
	21	57		I.	Sh.	Eg.
	23	10		III.	Tr.	Eg.
2	1	12		III.	Sh.	In.
	3	1		III.	Sh.	Eg.
	15	53		I.	Oc.	Dis.
	19	3	33.1	I.	Ec.	Re.
	23	56		II.	Oc.	Dis.
3	4	28	43.3	II.	Ec.	Re.
	13	14		I.	Tr.	In.
	14	14		I.	Sh.	In.
	15	28		I.	Tr.	Eg.
	16	26		I.	Sh.	Eg.
4	10	23		I.	Oc.	Dis.
	13	32	11.7	I.	Ec.	Re.
	18	7		II.	Tr.	In.
	20	7		II.	Sh.	In.
	20	44		II.	Tr.	Eg.
	22	40		II.	Sh.	Eg.
5	7	44		I. *	Tr.	In.
	8	43		I.	Sh.	In.
	9	58		I.	Tr.	Eg.
	10	55		I.	Sh.	Eg.
	11	9		III.	Oc.	Dis.
	13	25		III.	Oc.	Re.
	15	25	11.2	III.	Ec.	Dis.
	16	57	46.0	III.	Ec.	Re.
6	4	53		I.	Oc.	Dis.
	8	0	53.2	I.	Ec.	Re.
	13	19		II.	Oc.	Dis.
	17	46	30.1	II.	Ec.	Re.
7	2	14		I.	Tr.	In.
	3	11		I.	Sh.	In.
	4	28		I.	Tr.	Eg.
	5	23		I.	Sh.	Eg.
	23	23		I.	Oc.	Dis.
8	2	29	31.1	I.	Ec.	Re.
	7	30		II. *	Tr.	In.
	9	25		II.	Sh.	In.
	10	7		II.	Tr.	Eg.
	11	58		II.	Sh.	Eg.
	20	44		I.	Tr.	In.
	21	40		I.	Sh.	In.
	22	58		I.	Tr.	Eg.
	23	52		I.	Sh.	Eg.
9	1	13		III.	Tr.	In.
	3	29		III.	Tr.	Eg.
	5	11		III.	Sh.	In.
	6	59		III. *	Sh.	Eg.
	17	53		I.	Oc.	Dis.
	20	58	14.3	I.	Ec.	Re.
10	2	42		II.	Oc.	Dis.
	7	4	45.0	II. *	Ec.	Re.
	15	14		I.	Tr.	In.
	16	9		I.	Sh.	In.
	17	28		I.	Tr.	Eg.
10	18	21		I.	Sh.	Eg.
11	12	23		I.	Oc.	Dis.
	15	26	52.4	I.	Ec.	Re.
	20	53		II.	Tr.	In.
	22	43		II.	Sh.	In.
	23	30		II.	Tr.	Eg.
12	1	15		II.	Sh.	Eg.
	9	44		I.	Tr.	In.
	10	37		I.	Sh.	In.
	11	58		I.	Tr.	Eg.
	12	49		I.	Sh.	Eg.
	15	29		III.	Oc.	Dis.
	17	44		III.	Oc.	Re.
	19	24	11.6	III.	Ec.	Dis.
	20	56	18.8	III.	Ec.	Re.
13	6	53		I. *	Oc.	Dis.
	9	55	32.6	I.	Ec.	Re.
	16	6		II.	Oc.	Dis.
	20	22	28.2	II.	Ec.	Re.
14	4	14		I.	Tr.	In.
	5	6		I.	Sh.	In.
	6	28		I.	Tr.	Eg.
	7	18		I. *	Sh.	Eg.
15	1	23		I.	Oc.	Dis.
	4	24	10.7	I.	Ec.	Re.
	10	16		II.	Tr.	In.
	12	1		II.	Sh.	In.
	12	54		II.	Tr.	Eg.
	14	33		II.	Sh.	Eg.
	22	45		I.	Tr.	In.
	23	35		I.	Sh.	In.
16	0	58		I.	Tr.	Eg.
	1	47		I.	Sh.	Eg.
	5	35		III.	Tr.	In.
	7	49		III.	Tr.	Eg.
	9	10		III.	Sh.	In.
	10	58		III.	Sh.	Eg.
	19	53		I.	Oc.	Dis.
	22	52	53.7	I.	Ec.	Re.
17	5	30		II.	Oc.	Dis.
	9	40	35.0	II.	Ec.	Re.
	17	15		I.	Tr.	In.
	18	3		I.	Sh.	In.
	19	28		I.	Tr.	Eg.
	20	15		I.	Sh.	Eg.
18	14	23		I.	Oc.	Dis.
	17	21	31.3	I.	Ec.	Re.
	23	40		II.	Tr.	In.
19	1	19		II.	Sh.	In.
	2	17		II.	Tr.	Eg.
	3	51		II.	Sh.	Eg.
	11	45		I.	Tr.	In.
	12	32		I.	Sh.	In.
	13	58		I.	Tr.	Eg.
	14	44		I.	Sh.	Eg.
	19	52		III.	Oc.	Dis.
	22	5		III.	Oc.	Re.
	23	23	10.9	III.	Ec.	Dis.
20	0	54	52.7	III.	Ec.	Re.
	8	53		I.	Oc.	Dis.
	11	50	11.9	I.	Ec.	Re.
	18	54		II.	Oc.	Dis.
	22	58	13.4	II.	Ec.	Re.
21	6	15		I.	Tr.	In.
	7	1		I.	Sh.	In.
	8	28		I.	Tr.	Eg.
	9	13		I.	Sh.	Eg.
22	3	23		I.	Oc.	Dis.
	6	18	48.5	I.	Ec.	Re.
	13	4		II.	Tr.	In.
	14	37		II.	Sh.	In.
	15	41		II.	Tr.	Eg.
	17	9		II.	Sh.	Eg.
23	0	45		I.	Tr.	In.
	1	29		I.	Sh.	In.
	2	58		I.	Tr.	Eg.
	3	41		I.	Sh.	Eg.
	9	58		III.	Tr.	In.
	12	11		III.	Tr.	Eg.
	13	9		III.	Sh.	In.
	14	56		III.	Sh.	Eg.
	21	53		I.	Oc.	Dis.
24	0	47	31.1	I.	Ec.	Re.
	8	18		II.	Oc.	Dis.
	12	16	11.6	II.	Ec.	Re.
	19	15		I.	Tr.	In.
	19	58		I.	Sh.	In.
	21	28		I.	Tr.	Eg.
	22	10		I.	Sh.	Eg.
25	16	24		I.	Oc.	Dis.
	19	16	8.0	I.	Ec.	Re.
26	2	28		II.	Tr.	In.
	3	54		II.	Sh.	In.
	5	5		II.	Tr.	Eg.
	6	26		II.	Sh.	Eg.
	13	45		I.	Tr.	In.
	14	27		I.	Sh.	In.
	15	59		I.	Tr.	Eg.
	16	39		I.	Sh.	Eg.
27	0	17		III.	Oc.	Dis.
	2	29		III.	Oc.	Re.
	3	22	44.1	III.	Ec.	Dis.
	4	54	2.7	III.	Ec.	Re.
	10	54		I.	Oc.	Dis.
	13	44	48.2	I.	Ec.	Re.
	21	42		II.	Oc.	Dis.
28	1	33	45.3	II.	Ec.	Re.
	8	15		I.	Tr.	In.
	8	55		I.	Sh.	In.
	10	29		I.	Tr.	Eg.
	11	7		I.	Sh.	Eg.
29	5	24		I.	Oc.	Dis.
	8	13	24.0	I.	Ec.	Re.
	15	53		II.	Tr.	In.
	17	12		II.	Sh.	In.
	18	29		II.	Tr.	Eg.
	19	44		II.	Sh.	Eg.
30	2	45		I.	Tr.	In.
	3	24		I.	Sh.	In.
	4	59		I.	Tr.	Eg.
	5	36		I.	Sh.	Eg.
	14	22		III.	Tr.	In.
	16	34		III.	Tr.	Eg.
	17	7		III.	Sh.	In.
	18	54		III.	Sh.	Eg.
	23	54		I.	Oc.	Dis.

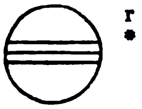
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

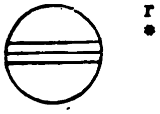
SEPTEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

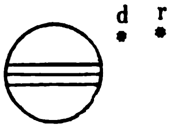
I.



II.



III.



Configurations at 7ʰ 30ᵐ for an Inverting Telescope.

Day.	West.		East.
1	○ 2·	○	·1 3· ·4
2	·2 ·1 3·	○	4·
3	3·	○	2 1· 4·
4	·3 ·1	○	2· 4·
5	2· ·3	1○·	4·
6	·2 4·	○	·1 ·3
7	4· 1·	○	·2 3·
8	4·	2○·	·1 3·
9	4· ·2 1· 3·	○	
10	4· 3·	○	·2 1·
11	·4 ·3 ·1	○	2·
12	·4 2· ·3	○	1·
13	·4 ·2	○	·3 ·1 ●
14	·4 1·	○	·2 ·3
15		○	2· ·1 ·4 3·
16	○ 3· 2· 1·	○	·4
17	3·	○	·1 ·4 ·2 ●
18	·3 ·1	○	2· ·4
19	·3 2·	○	1· 4·
20	·2 ·1	○	·3 4·
21	○ 1·	○	·2 3 4·
22		○	·1 2· 4· 3·
23	2· 1· 4·	○	3·
24	4· 3·	·○	2 ·1
25	4· ·3 ·1	○	2·
26	4· ·3 2·	○	1·
27	·4 ·2 ·1	○	·3
28	·4	1○·	·2 ·3
29	·4	○	2· 3· ·1 ●
30	·4 2· 1·	○	3·

WASHINGTON MEAN TIME.

OCTOBER.

d	h	m	s				d	h	m	s				d	h	m	s			
1	2	42	5.9	I.	Ec.	Re.	5	10	15		I.	Tr.	In.	9	1	30		I.	Tr.	Eg.
	11	6		II.	Oc.	Dis.		10	50		I.	Sh.	In.		2	0		I.	Sh.	Eg.
	14	51	24.6	II.	Ec.	Re.		12	29		I.	Tr.	Eg.		20	26		I.	Oc.	Dis.
	21	15		I.	Tr.	In.		13	2		I.	Sh.	Eg.		23	5	14.3	I.	Ec.	Re.
	21	51		I.	Sh.	In.	6	7	25		I.	Oc.	Dis.	10	5	6		II.	Tr.	In.
	23	29		I.	Tr.	Eg.		10	7	57.2	I.	Ec.	Re.		9	6		II.	Sh.	In.
2	0	5		I.	Sh.	Eg.		18	42		II.	Tr.	In.		10	42		II.	Tr.	Eg.
	18	24		I.	Oc.	Dis.		19	48		II.	Sh.	In.		11	38		II.	Sh.	Eg.
	21	10	42.2	I.	Ec.	Re.		21	19		II.	Tr.	Eg.		17	46		I.	Tr.	In.
3	5	17		II.	Tr.	In.		22	20		II.	Sh.	Eg.		18	16		I.	Sh.	In.
	6	20		II.*	Sh.	In.	7	4	46		I.	Tr.	In.		20	0		I.	Tr.	Eg.
	7	53		II.	Tr.	Eg.		5	19		I.	Sh.	In.		20	28		I.	Sh.	Eg.
	9	2		II.	Sh.	Eg.		7	0		I.	Tr.	Eg.	11	9	5		III.	Oc.	Dis.
	15	45		I.	Tr.	In.		7	31		I.	Sh.	Re.		11	15		III.	Oc.	Re.
	16	21		I.	Sh.	In.		18	43		III.	Tr.	In.		11	20	35.8	III.	Ec.	Dis.
	17	59		I.	Tr.	Eg.		20	58		III.	Tr.	Eg.		12	51	15.4	III.	Ec.	Re.
	18	33		I.	Sh.	Eg.		21	6		III.	Sh.	In.		14	56		I.	Oc.	Dis.
4	4	42		III.	Oc.	Dis.		22	53		III.	Sh.	Eg.		17	33	53.7	I.	Ec.	Re.
	6	53		III.	Oc.	Re.	8	1	55		I.	Oc.	Dis.	12	3	19		II.	Oc.	Dis.
	7	21	39.1	III.	Ec.	Dis.		4	36	38.6	I.	Ec.	Re.		6	44	9.2	II.	Ec.	Re.
	8	52	37.1	III.	Ec.	Re.		13	55		II.	Oc.	Dis.		12	17		I.	Tr.	In.
	12	55		I.	Oc.	Dis.		17	26	44.9	II.	Ec.	Re.		12	44		I.	Sh.	In.
	15	39	22.3	I.	Ec.	Re.		23	16		I.	Tr.	In.		14	30		I.	Tr.	Eg.
5	0	30		II.	Oc.	Dis.		23	47		I.	Sh.	In.		14	57		I.	Sh.	Eg.
	4	9	4.0	II.	Ec.	Re.														

The Satellites are not visible from October 13 to December 1, Jupiter being too near the Sun.

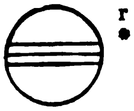
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow: * Visible at Washington.

WASHINGTON MEAN TIME.

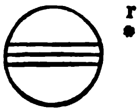
OCTOBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

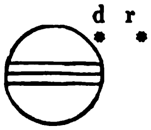
I.



II.



III.



Configurations at 6^h 30^m for an Inverting Telescope.

Day.	West.		East.
1	3· ·2 ·	○	4 ·1
2	3· 1·	○	·4 ·2
3	○ 2· ·3	○	1· ·4
4	·2 ·1	○	·4 ·3 ●
5		○	·2 1· ·3 ·4
6	·	○	1 2· 3· 4·
7	○ 1· 2·	○	3· 4·
8	·2 3·	○	·1 4·
9	3· 1·	○	4· ·2
10	·3 4·	○	2· ·1
11	4· 2· ·1 ·	○	3
12	4·	○	·2 1· ·3

WASHINGTON MEAN TIME.

DECEMBER.

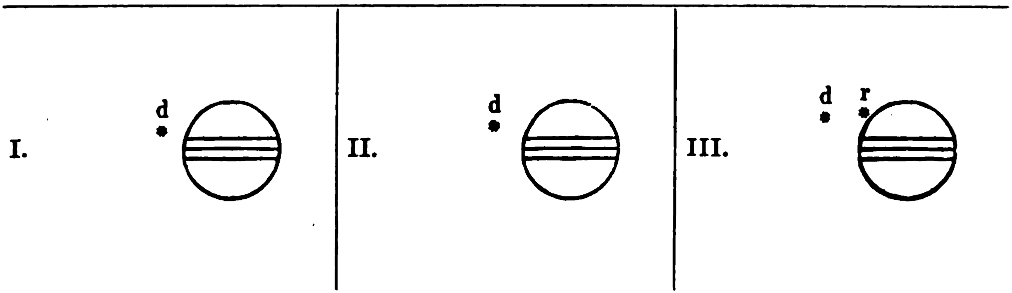
d	h	m	s			
1	1	33		II.	Oc.	Re.
	2	2		I.	Sh.	In.
	2	24		I.	Tr.	In.
	4	14		I.	Sh.	Eg.
	4	37		I.	Tr.	Eg.
	23	14	38.0	I.	Ec.	Dis.
2	1	48		I.	Oc.	Re.
	16	38		II.	Sh.	In.
	17	26		II.	Tr.	In.
	19	9		II.	Sh.	Eg.
	19	59		II.	Tr.	Eg.
	20	30		I.	Sh.	In.
	20	54		I.	Tr.	In.
	22	42		I.	Sh.	Eg.
	23	7		I.	Tr.	Eg.
3	17	43	11.8	I.	Ec.	Dis.
	20	19		I.	Oc.	Re.
4	4	52		III.	Sh.	In.
	6	32		III.	Tr.	In.
	6	37		III.	Sh.	Eg.
	8	28		III.	Tr.	Eg.
	11	36	5.9	II.	Ec.	Dis.
	14	57		II.	Oc.	Re.
	14	58		I.	Sh.	In.
	15	24		I.	Tr.	In.
	17	10		I.	Sh.	Eg.
	17	37		I.	Tr.	Eg.
5	12	11	39.6	I.	Ec.	Dis.
	14	49		I.	Oc.	Re.
6	5	56		II.	Sh.	In.
	6	51		II.	Tr.	In.
	8	27		II.	Sh.	Eg.
	9	23		II.	Tr.	Eg.
	9	26		I.	Sh.	In.
	9	54		I.	Tr.	In.
	11	38		I.	Sh.	Eg.
	12	7		I.	Tr.	Eg.
7	6	40	12.1	I.	Ec.	Dis.
	9	19		I.	Oc.	Re.
	19	7	55.5	III.	Ec.	Dis.
	20	37	30.9	III.	Ec.	Re.
	20	54		III.	Oc.	Dis.
	22	49		III.	Oc.	Re.
8	0	52	54.1	II.	Ec.	Dis
	3	55		I.	Sh.	In.
	4	20		II.	Oc.	Re.
	4	24		I.	Tr.	In.
	6	7		I.	Sh.	Eg.
	6	37		I.	Tr.	Eg.
9	1	8	37.5	I.	Ec.	Dis.
	3	49		I.	Oc.	Re.
	19	14		II.	Sh.	In.
	20	16		II.	Tr.	In.
	21	45		II.	Sh.	Eg.
	22	23		I.	Sh.	In.
	22	48		II.	Tr.	Eg.
	22	54		I.	Tr.	In.
10	0	35		I.	Sh.	Eg.
	1	7		I.	Tr.	Eg.
	19	37	10.2	I.	Ec.	Dis.
	22	20		I.	Oc.	Re.
11	8	51		III.	Sh.	In.
	10	36		III.	Sh.	Eg.
	10	59		III.	Tr.	In.
11	12	53		III.	Tr.	Eg.
	14	9	38.0	II.	Ec.	Dis.
	16	51		I.	Sh.	In.
	17	24		I.	Tr.	In.
	17	43		II.	*Oc.	Re.
	19	3		I.	Sh.	Eg.
	19	37		I.	Tr.	Eg.
12	14	5	37.1	I.	Ec.	Dis.
	16	50		I.	Oc.	Re.
13	8	32		II.	Sh.	In.
	9	40		II.	Tr.	In.
	11	3		II.	Sh.	Eg.
	11	20		I.	Sh.	In.
	11	54		I.	Tr.	In.
	12	12		II.	Tr.	Eg.
	13	32		I.	Sh.	Eg.
	14	7		I.	Tr.	Eg.
14	8	34	8.8	I.	Ec.	Dis.
	11	20		I.	Oc.	Re.
	23	5	39.6	III.	Ec.	Dis.
15	0	35	17.8	III.	Ec.	Re.
	1	20		III.	Oc.	Dis.
	3	14		III.	Oc.	Re.
	3	26	21.2	II.	Ec.	Dis.
	5	48		I.	Sh.	In.
	6	24		I.	Tr.	In.
	7	6		II.	Oc.	Re.
	8	0		I.	Sh.	Eg.
	8	36		I.	Tr.	Eg.
16	3	2	33.1	I.	Ec.	Dis.
	5	50		I.	Oc.	Re.
	21	51		II.	Sh.	In.
	23	5		II.	Tr.	In.
17	0	17		I.	Sh.	In.
	0	22		II.	Sh.	Eg.
	0	54		I.	Tr.	In.
	1	37		II.	Tr.	Eg.
	2	28		I.	Sh.	Eg.
	3	6		I.	Tr.	Eg.
	21	31	5.0	I.	Ec.	Dis.
18	0	20		I.	Oc.	Re.
	12	48		III.	Sh.	In.
	14	34		III.	Sh.	Eg.
	15	24		III.	Tr.	In.
	16	43	0.9	II.	Ec.	Dis.
	17	17		III.	Tr.	Eg.
	18	46		I.	Sh.	In.
	19	24		I.	Tr.	In.
	20	29		II.	Oc.	Re.
	20	57		I.	Sh.	Eg.
	21	36		I.	Tr.	Eg.
19	15	59	30.7	I.	Ec.	Dis.
	18	50		I.	Oc.	Re.
20	11	9		II.	Sh.	In.
	12	29		II.	Tr.	In.
	13	14		I.	Sh.	In.
	13	40		II.	Sh.	Eg.
	13	54		I.	Tr.	In.
	15	0		II.	Tr.	Eg.
	15	25		I.	Sh.	Eg.
	16	6		I.	Tr.	Eg.
21	10	28	1.5	I.	Ec.	Dis.
	13	20		I.	Oc.	Re.
22	3	3	38.8	III.	Ec.	Dis.
22	4	33	22.4	III.	Ec.	Re.
	5	45		III.	Oc.	Dis.
	5	59	40.3	II.	Ec.	Dis.
	7	37		III.	Oc.	Re.
	7	42		I.	Sh.	In.
	8	24		I.	Tr.	In.
	9	51		II.	Oc.	Re.
	9	53		I.	Sh.	Eg.
	10	36		I.	Tr.	Eg.
23	4	56	24.9	I.	Ec.	Dis.
	7	50		I.	Oc.	Re.
24	0	27		II.	Sh.	In.
	1	53		II.	Tr.	In.
	2	10		I.	Sh.	In.
	2	54		I.	Tr.	In.
	2	58		II.	Sh.	Eg.
	4	22		I.	Sh.	Eg.
	4	24		II.	Tr.	Eg.
	5	6		I.	Tr.	Eg.
	23	24	55.7	I.	Ec.	Dis.
25	2	20		I.	Oc.	Re.
	16	46		III.	Sh.	In.
	18	31		III.	*Sh.	Eg.
	19	16	16.6	II.	Ec.	Dis.
	19	47		III.	Tr.	In.
	20	38		I.	Sh.	In.
	21	24		I.	Tr.	In.
	21	39		III.	Tr.	Eg.
	22	50		I.	Sh.	Eg.
	23	14		II.	Oc.	Re.
	23	36		I.	Tr.	Eg.
26	17	53	20.6	I.	*Ec.	Dis.
	20	50		I.	Oc.	Re.
27	13	45		II.	Sh.	In.
	15	6		I.	Sh.	In.
	15	17		II.	Tr.	In.
	15	54		I.	Tr.	In.
	16	16		II.	Sh.	Eg.
	17	18		I.	*Sh.	Eg.
	17	48		II.	*Tr.	Eg.
	18	6		I.	*Tr.	Eg.
28	12	21	50.8	I.	Ec.	Dis.
	15	20		I.	Oc.	Re.
29	7	1	32.9	III.	Ec.	Dis.
	8	31	24.3	III.	Ec.	Re.
	8	32	52.2	II.	Ec.	Dis.
	9	35		I.	Sh.	In.
	10	8		III.	Oc.	Dis.
	10	24		I.	Tr.	In.
	11	47		I.	Sh.	Eg.
	11	59		III.	Oc.	Re.
	12	36		I.	Tr.	Eg.
	12	36		II.	Oc.	Re.
30	6	50	13.3	I.	Ec.	Dis.
	9	50		I.	Oc.	Re.
31	3	3		II.	Sh.	In.
	4	3		I.	Sh.	In.
	4	42		II.	Tr.	In.
	4	54		I.	Tr.	In.
	5	34		II.	Sh.	Eg.
	6	15		I.	Sh.	Eg.
	7	6		I.	Tr.	Eg.
	7	12		II.	Tr.	Eg.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

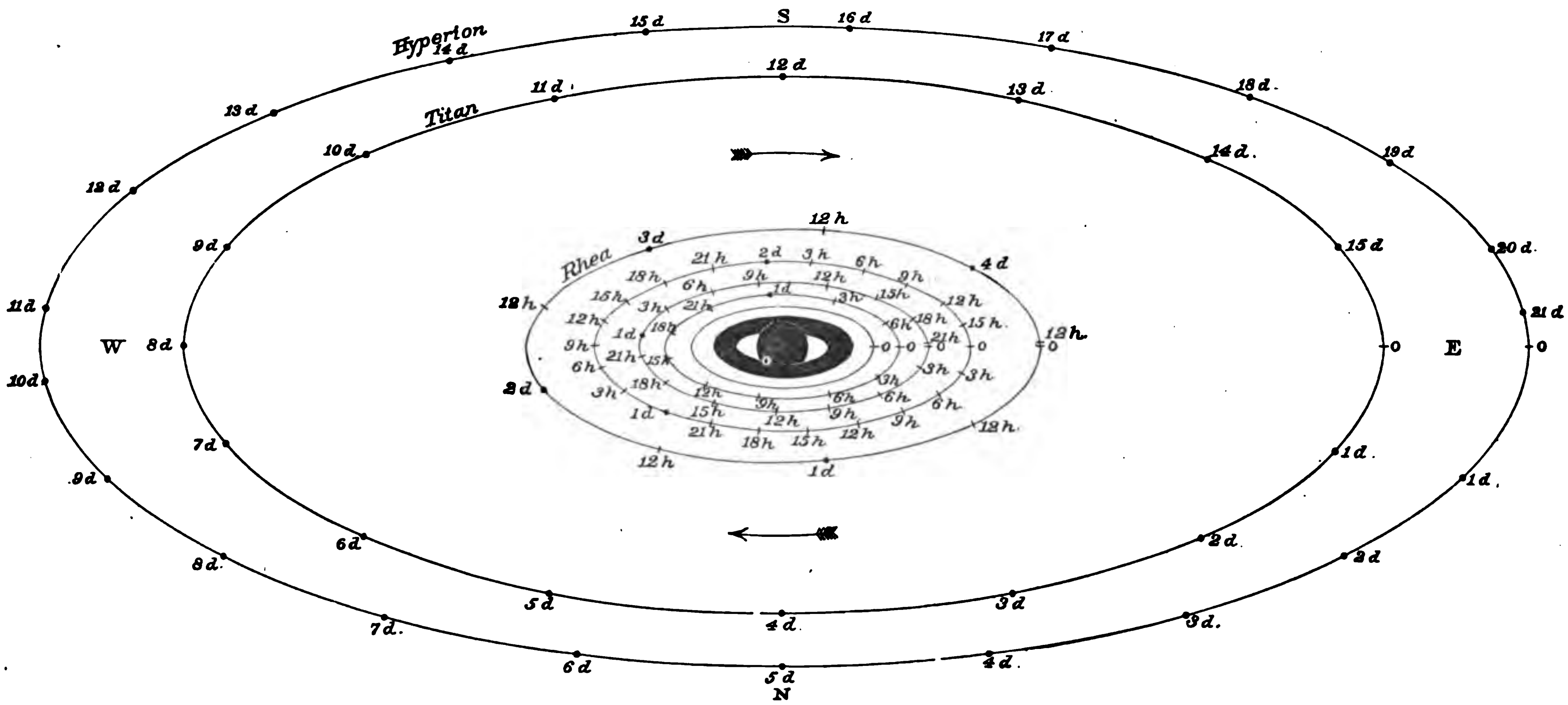
DECEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 18h 0m for an Inverting Telescope.

Day.	West.		East.
1	4· ·1	○	·2 ·3
2	○ 2· 4·	○	1· 3·
3	·4 ·2 ·	○	1 3·
4	·4 3· 1·	○	·2
5	·4 3·	○	·1 2·
6	·3 ·4 1· 2·	○	
7	·2 . ·	○	4 3 ·1
8	·1	○	·4 ·2 ·3
9		○	2· 1· 3· ·4
10	2· ·1	○	3· ·4
11	○ 1· 3·	○	·2 ·4
12	3·	○	·1 2· 4·
13	·3 1· 2·	○	4·
14	·2 ·3	○	·1 4·
15	1·	○	4· 3 ·2
16	4·	○	1· 2· ·3
17	4· 2· ·1	○	3·
18	○ 3· 4·	○	1· ·2 ●
19	4· 3·	○	2· ·1 ●
20	·4 ·3 1· 2·	○	
21	·4 ·2 ·3	○	·1
22	·4 1·	○	3 ·2
23	·4	○	1· 2· ·3
24	2· ·1	·4 ○	3·
25	·2	○	3· 1· ·4
26	3· ·	○	1 ·2 ·4
27	○ 1· ·3 2·	○	·4
28	3 ·2	○	·1 ·4
29	1·	○	3 ·2 4·
30		○	·1 2· ·3 4·
31	2· ·1	○	3· 4·



APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN IN 1886 AND 1887, AS SEEN IN AN INVERTING TELESCOPE.

Names of the Satellites.	
I.	Mimas.
II.	Enceladus.
III.	Tethys.
IV.	Dione.
V.	Rhea.
VI.	Titan.
VII.	Hyperion.
VIII.	Japetus.

Mean Synodic Periods.	d	h
I.	0	22.6
II.	1	8.9
III.	1	21.3
IV.	2	17.7
V.	4	12.5
VI.	15	23.3
VII.	21	7.8
VIII.	79	22.0

WASHINGTON MEAN TIMES OF ELONGATION, ETC.

In the diagram on the preceding page, the points of the orbits marked "o" are those of the eastern elongation, as seen in an inverting telescope. The apparent positions of a satellite at any time may be marked on the diagram by counting around the orbit the interval in days and hours which has elapsed since the last east elongation. The times of these elongations may be found from the following tables. Mimas can be seen only within a few hours of each elongation: the time of every elongation visible at Washington is therefore given. The times of other elongations of any satellite in the same direction may be found by adding or subtracting any multiple of the period. For the three outer satellites the times of elongation and conjunction are given. The following abbreviations are used:—

E., East Elongation,
I., Inferior Conjunction (north of planet),
W., West Elongation,
S., Superior Conjunction (south of planet).

MIMAS.

Elongations Visible at Washington.

	d	h			d	h			d	h			d	h			d	h			d	h	
Jan.	1	8.5	E.	Jan.	27	6.3	W.	Feb.	27	8.7	W.	Apr	1	8.4	W.	Oct.	20	13.5	E.	Nov.	28	16.3	W.
	2	7.1	E.		31	12.1	E.		28	7.3	W.		2	7.0	W.		25	18.0	W.		29	14.9	W.
	3	5.7	E.	Feb.	1	10.7	E.	Mar.	1	5.9	W.		8	10.1	E.		26	16.6	W.		30	13.5	W.
	6	12.9	W.		2	9.3	E.		5	11.7	E.		9	8.7	E.		27	15.2	W.	Dec.	1	12.2	W.
	7	11.5	W.		3	8.0	E.		6	10.3	E.		10	7.3	E.		28	13.8	W.		2	10.8	W.
	8	10.1	W.		4	6.6	E.		7	8.9	E.		16	10.3	W.		29	12.4	W.		7	15.1	E.
	9	8.7	W.		8	12.4	W.		8	7.6	E.		17	8.9	W.	Nov.	3	16.9	E.		8	13.7	E.
	10	7.3	W.		9	11.0	W.		9	6.2	E.		18	7.5	W.		4	15.5	E.		9	12.3	E.
	11	5.9	W.		10	9.6	W.		13	12.0	W.		25	9.2	E.		5	14.1	E.		10	10.9	E.
	14	13.1	E.		11	8.2	W.		14	10.6	W.		26	7.8	E.		6	12.7	E.		15	15.3	W.
	15	11.7	E.		12	6.8	W.		15	9.2	W.	Oct.	1	17.1	E.		11	17.0	W.		16	14.0	W.
	16	10.3	E.		16	12.6	E.		16	7.8	W.		2	15.7	E.		12	15.6	W.		17	12.6	W.
	17	8.9	E.		17	11.2	E.		17	6.5	W.		3	14.3	E.		13	14.3	W.		18	11.2	W.
	18	7.5	E.		18	9.8	E.		22	10.9	E.		9	17.2	W.		14	12.9	W.		19	9.8	W.
	19	6.1	E.		19	8.4	E.		23	9.5	E.		10	15.8	W.		15	11.5	W.		24	14.2	E.
	23	11.9	W.		20	7.1	E.		24	8.1	E.		11	14.4	W.		20	15.9	E.		25	12.8	E.
	24	10.5	W.		24	12.9	W.		25	6.7	E.		17	17.6	E.		21	14.5	E.		26	11.4	E.
	25	9.1	W.		25	11.5	W.		30	11.1	W.		18	16.2	E.		22	13.2	E.		27	10.0	E.
	26	7.7	W.		26	10.1	W.		31	9.8	W.		19	14.8	E.		23	11.8	E.		28	8.6	E.

ENCELADUS.

	d	h			d	h			d	h			d	h			d	h			d	h	
Jan.	1	9.8	E.	Jan.	15	2.5	E.	Jan.	28	19.2	E.	Feb.	11	12.0	E.	Feb.	25	4.7	E.	Mar.	10	21.5	E.
	2	18.6	E.		16	11.4	E.		30	4.1	E.		12	20.9	E.		26	13.6	E.		12	6.4	E.
	4	3.5	E.		17	20.2	E.		31	12.9	E.		14	5.7	E.		27	22.5	E.		13	15.3	E.
	5	12.4	E.		19	5.1	E.	Feb.	1	21.8	E.		15	14.6	E.	Mar.	1	7.4	E.		15	0.2	E.
	6	21.2	E.		20	13.9	E.		3	6.7	E.		16	23.4	E.		2	16.2	E.		16	9.1	E.
	8	6.1	E.		21	22.8	E.		4	15.6	E.		18	8.3	E.		4	1.1	E.		17	18.0	E.
	9	15.0	E.		23	7.6	E.		6	0.5	E.		19	17.1	E.		5	9.9	E.		19	2.9	E.
	10	23.8	E.		24	16.5	E.		7	9.3	E.		21	2.0	E.		6	18.8	E.		20	11.7	E.
	12	8.7	E.		26	1.4	E.		8	18.2	E.		22	10.9	E.		8	3.7	E.		21	20.6	E.
	13	17.6	E.		27	10.3	E.		10	3.1	E.		23	19.8	E.		9	12.6	E.		28	5.5	E.

WASHINGTON MEAN TIMES OF EAST ELONGATIONS.

ENCELADUS—(*Concluded.*)

	d	h		d	h		d	h		d	h		d	h		d	h
Mar.	24	14.4 E.	Apr.	14	3.8 E.	Oct.	12	2.5 E.	Nov.	1	15.9 E.	Nov.	22	5.2 E.	Dec.	12	18.4 E.
	25	23.3 E.		15	12.7 E.		13	11.4 E.		3	0.8 E.		23	14.1 E.		14	3.3 E.
	27	8.2 E.		16	21.5 E.		14	20.3 E.		4	9.7 E.		24	23.0 E.		15	12.2 E.
	28	17.1 E.		18	6.4 E.		16	5.2 E.		5	18.6 E.		26	7.9 E.		16	21.1 E.
	30	2.0 E.		19	15.3 E.		17	14.1 E.		7	3.5 E.		27	16.8 E.		18	6.0 E.
	31	10.9 E.		21	0.2 E.		18	23.0 E.		8	12.3 E.		29	1.6 E.		19	14.8 E.
Apr.	1	19.8 E.		22	9.1 E.		20	7.9 E.		9	21.2 E.		30	10.5 E.		20	23.7 E.
	3	4.6 E.		23	18.0 E.		21	16.8 E.		11	6.1 E.	Dec.	1	19.4 E.		22	8.6 E.
	4	13.5 E.		25	2.9 E.		23	1.7 E.		12	15.0 E.		3	4.3 E.		23	17.5 E.
	5	22.4 E.		26	11.8 E.		24	10.6 E.		13	23.9 E.		4	13.2 E.		25	2.4 E.
	7	7.3 E.	Oct.	5	6.1 E.		25	19.4 E.		15	8.8 E.		5	22.0 E.		26	11.2 E.
	8	16.2 E.		6	15.0 E.		27	4.3 E.		16	17.7 E.		7	6.9 E.		27	20.1 E.
	10	1.1 E.		7	23.9 E.		28	13.2 E.		18	2.6 E.		8	15.8 E.		29	4.9 E.
	11	10.0 E.		9	8.8 E.		29	22.1 E.		19	11.5 E.		10	0.7 E.		30	13.8 E.
	12	18.9 E.		10	17.7 E.		31	7.0 E.		20	20.4 E.		11	9.6 E.		31	22.6 E.

TETHYS.

	d	h		d	h		d	h		d	h		d	h		d	h
Jan.	1	0.7 E.	Feb.	7	18.5 E.	Mar.	17	12.3 E.	Apr.	24	6.6 E.	Oct.	18	20.3 E.	Nov.	25	14.5 E.
	2	22.0 E.		9	15.8 E.		19	9.6 E.		26	4.0 E.		20	17.6 E.		27	11.8 E.
	4	19.3 E.		11	13.0 E.		21	7.0 E.		28	1.4 E.		22	14.9 E.		29	9.1 E.
	6	16.6 E.		13	10.3 E.		23	4.3 E.		29	22.7 E.		24	12.2 E.	Dec.	1	6.4 E.
	8	13.9 E.		15	7.6 E.		25	1.6 E.	May	1	20.0 E.		26	9.5 E.		3	3.6 E.
	10	11.2 E.		17	4.9 E.		26	22.9 E.		3	17.3 E.		28	6.8 E.		5	0.9 E.
	12	8.5 E.		19	2.2 E.		28	20.3 E.		5	14.7 E.		30	4.1 E.		6	22.2 E.
	14	5.8 E.		20	23.5 E.		30	17.6 E.		7	12.0 E.	Nov.	1	1.3 E.		8	19.5 E.
	16	3.1 E.		22	20.8 E.	Apr.	1	14.9 E.					2	22.7 E.		10	16.9 E.
	18	0.4 E.		24	18.1 E.		3	12.2 E.					4	20.0 E.		12	14.2 E.
	19	21.6 E.		26	15.4 E.		5	9.5 E.	Sept.	29	23.1 E.		6	17.3 E.		14	11.5 E.
	21	18.9 E.		28	12.7 E.		7	6.8 E.	Oct.	1	20.4 E.		8	14.7 E.		16	8.8 E.
	23	16.2 E.	Mar.	2	10.0 E.		9	4.1 E.		3	17.7 E.		10	12.1 E.		18	6.1 E.
	25	13.5 E.		4	7.3 E.		11	1.4 E.		5	15.0 E.		12	9.4 E.		20	3.4 E.
	27	10.8 E.		6	4.6 E.		12	22.8 E.		7	12.3 E.		14	6.7 E.		22	0.7 E.
	29	8.1 E.		8	1.9 E.		14	20.1 E.		9	9.6 E.		16	4.0 E.		23	22.0 E.
	31	5.4 E.		9	23.2 E.		16	17.4 E.		11	7.0 E.		18	1.3 E.		25	19.2 E.
Feb.	2	2.7 E.		11	20.5 E.		18	14.7 E.		13	4.3 E.		19	22.6 E.		27	16.5 E.
	3	23.9 E.		13	17.7 E.		20	12.0 E.		15	1.6 E.		21	19.9 E.		29	13.8 E.
	5	21.2 E.		15	15.0 E.		22	9.3 E.		16	22.9 E.		23	17.2 E.		31	11.1 E.

DIONE.

	d	h		d	h		d	h		d	h		d	h		d	h
Jan.	2	1.0 E.	Feb.	3	20.8 E.	Mar.	8	16.7 E.	Apr.	10	13.0 E.	Oct.	27	12.1 E.	Nov.	29	8.4 E.
	4	18.7 E.		6	14.4 E.		11	10.3 E.		13	6.7 E.		30	5.8 E.	Dec.	2	2.1 E.
	7	12.4 E.		9	8.1 E.		14	4.0 E.		16	0.4 E.	Nov.	1	23.5 E.		4	19.7 E.
	10	6.0 E.		12	1.7 E.		16	21.7 E.		18	18.1 E.		4	17.2 E.		7	13.4 E.
	12	23.6 E.		14	19.3 E.		19	15.4 E.		21	11.8 E.		7	10.9 E.		10	7.0 E.
	15	17.2 E.		17	12.9 E.		22	9.1 E.	Oct.	8	8.1 E.		10	4.6 E.		13	0.7 E.
	18	10.9 E.		20	6.6 E.		25	2.8 E.		11	1.9 E.		12	22.3 E.		15	18.3 E.
	21	4.5 E.		23	0.3 E.		27	20.4 E.		13	19.6 E.		15	16.0 E.		18	12.0 E.
	23	22.2 E.		25	18.0 E.		30	14.1 E.		16	13.3 E.		18	9.7 E.		21	5.6 E.
	26	15.8 E.		28	11.7 E.	Apr.	2	7.9 E.		19	7.0 E.		21	3.4 E.		23	23.3 E.
	29	9.5 E.	Mar.	3	5.4 E.		5	1.6 E.		22	0.7 E.		23	21.0 E.		26	17.0 E.
Feb.	1	3.1 E.		5	23.0 E.		7	19.3 E.		24	18.4 E.		26	14.7 E.		29	10.7 E.

RHEA.				TITAN.				HYPERION.			
d	h	d	h	d	h	d	h	d	h	d	h
Jan. 1	3.7 E.	Sep. 20	8.5 E.	Jan. 1	2.4 W.	Oct. 3	20.5 S.	Jan. 0	19.0 S.	Sep. 14	0.2 S.
5	15.9 E.	24	21.1 E.	5	1.5 S.	7	20.8 E.	6	2.0 E.	19	8.9 E.
10	4.2 E.	29	9.6 E.	9	0.8 E.	11	20.9 I.	11	9.0 I.	24	17.5 I.
14	16.5 E.	Oct. 3	22.1 E.	12	23.9 I.	15	21.0 W.	16	16.0 W.	30	2.0 W.
19	4.8 E.	8	10.7 E.	16	23.0 W.	19	21.0 S.	21	23.0 S.	Oct. 5	10.4 S.
23	17.1 E.	12	23.2 E.	20	22.1 S.	23	21.2 E.	27	6.1 E.	10	18.6 E.
28	5.4 E.	17	11.7 E.	24	21.6 E.	27	21.0 I.	Feb. 1	13.2 I.	16	2.8 I.
Feb. 1	17.7 E.	22	0.2 E.	28	21.1 I.	31	20.6 W.	6	20.3 W.	21	10.9 W.
6	6.0 E.	26	12.7 E.	Feb. 1	20.6 W.	Nov. 4	20 2 S.	12	3.4 S.	26	19.0 S.
10	18.3 E.	31	1.1 E.	5	20.1 S.	8	20.2 E.	17	10.6 E.	Nov. 1	3.2 E.
15	6.6 E.	Nov. 4	13.6 E.	9	19.5 E.	12	19.8 I.	22	17.7 I.	6	11.2 I.
19	18.9 E.	9	2.1 E.	13	18.8 I.	16	19.3 W.	28	0.8 W.	11	19.1 W.
24	7.3 E.	13	14.5 E.	17	18.0 W.	20	18.8 S.	Mar. 5	7.9 S.	17	2.9 S.
28	19.6 E.	18	2.9 E.	21	17.2 S.	24	18.6 E.	10	15.3 E.	22	10.4 E.
Mar. 5	8.0 E.	22	15.4 E.	25	16.8 E.	28	18.0 I.	15	22.9 I.	27	17.9 I.
9	20.4 E.	27	3.7 E.	Mar. 1	16.2 I.	Dec. 2	17.4 W.	21	6.7 W.	Dec. 3	1.4 W.
14	8.8 E.	Dec. 1	16.1 E.	5	15.6 W.	6	16.8 S.	26	14.6 S.	8	8.9 S.
18	21.2 E.	6	4.5 E.	9	15.0 S.	10	16.4 E.	31	22.6 E.	13	16.3 E.
23	9.7 E.	10	16.8 E.	13	14.9 E.	14	15.9 I.	Apr. 6	6.6 I.	18	23.3 I.
27	22.1 E.	15	5.1 E.	17	14.4 I.	18	15.5 W.	11	14.7 W.	24	6.1 W.
Apr. 1	10.5 E.	19	17.4 E.	21	13.9 W.	22	15.1 S.	16	22.7 S.	29	12.9 S.
5	23.0 E.	24	5.7 E.	25	13.4 S.	26	14.6 E.	22	6.9 E.	1888	
10	11.4 E.	28	18.0 E.	29	13.3 E.	30	13.9 I.	27	15.2 I.	Jan. 3	19.9 E.
14	23.8 E.	33	6.3 E.	Apr. 2	13.2 I.	34	13.1 W.	May 2	23.6 W.		

JAPETUS	*East Elongation* . .	January 18	April 6	June 26	September 16	December 5
	Inferior Conjunction .	February 6	April 26	July 16	October 7	December 24
	West Elongation . .	February 26	May 16	August 6	October 27	
	Superior Conjunction .	March 17	June 6	August 27	November 15	

THE APPARENT ELEMENTS OF SATURN'S RINGS.

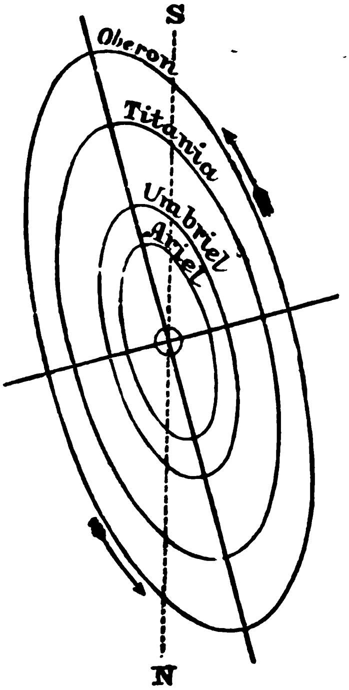
	a	b	p	l	l'	u	u'
Greenwich Mean Noon.	Outer Major Axis.	Outer Minor Axis.	Inclination of Northern Semi-Minor Axis to Circle of Declination from North to East.	The Elevation of the Earth above the Plane of the Ring.	The Elevation of the Sun above the Plane of the Ring.	Earth's Longitude from Saturn counted on Plane of Ring from the Ring's Ascending Node on	
						Equator.	Ecliptic.
Jan. 0	46″.46	18″.50	− 7° 23′.0	− 23° 28′.1	− 23° 46′.8	167° 40′.0	125° 3′.4
20	46.42	18.83	7 20.7	23 56.2	23 36.8	165 57.3	123 20.7
Feb. 9	45.68	18.83	7 18.3	24 20.4	23 26.6	164 26.7	121 50.2
Mar. 1	44.43	18.50	7 16.6	24 36.1	23 16.1	163 28.3	120 51.9
21	42.91	17.92	7 16.3	24 41.6	23 5.4	163 14.0	120 37.7
Apr. 10	41.35	17.21	− 7 17.4	− 24 36.2	− 22 54.5	163 46.9	121 10.7
30	39.93	16.46	7 19.7	24 20.4	22 43.4	165 2.6	122 26.5
May 20	38.76	15.71	7 22.7	23 55.1	22 32.0	166 53.2	124 17.1
June 9	37.90	15.03	7 25.5	23 21.4	22 20.4	169 9.4	126 33.4
29	37.38	14.41	7 27.7	22 40.7	22 8.6	171 41.5	129 5.6
July 19	37.21	13.89	− 7 28.9	− 21 55.1	− 21 56.6	174 20.5	131 44.7
Aug. 8	37.39	13.47	7 29.0	21 6.9	21 44.4	176 57.6	134 21.9
28	37.91	13.18	7 28.2	20 20.1	21 32.0	179 24.6	136 49.0
Sept. 17	38.78	13.02	7 26.8	19 37.2	21 19.3	181 32.8	138 57.2
Oct. 7	39.96	13.04	7 25.2	19 2.6	21 6.5	183 14.5	140 39.0
27	41.38	13.25	− 7 24.0	− 18 40.3	− 20 53.5	184 21.4	141 46.0
Nov. 16	42.93	13.66	7 23.5	18 33.3	20 40.3	184 47.5	142 12.2
Dec. 6	44.41	14.25	7 24.0	18 43.0	20 26.9	184 29.8	141 54.6
26	45.58	14.93	7 25.3	19 7.4	20 13.4	183 36.9	141 1.8
31	45.80	15.11	− 7 25.7	− 19 15 4	− 20 9.9	183 12.4	140 37.3

The factor to be multiplied by a and b to obtain the axes of—

The inner ellipse of the outer ring = 0.8801 log factor = 9.9445
The outer ellipse of the inner ring = 0.8599 log factor = 9.9344
The inner ellipse of the inner ring = 0.6650 log factor = 9.8228
The inner ellipse of the dusky ring = 0.5486 log factor = 9.7392

NOTE.—The negative sign of l indicates that the visible surface of the ring is the southern one.

Date.	Position Angle.	App. Distances. Ariel.	App. Distances. Umbriel.
Feb. 1,	14°.9	14″.8	20″.7
Apr. 1,	14.9	15.2	21.2
June 1,	14.9	14.8	20.7



Date.	Position Angle.	App. Distances. Titania.	App. Distances. Oberon.
Feb. 1,	14°.9	33″.8	45″.3
Apr. 1,	14.9	34.8	46.6
June 1,	14.9	33.9	44.1

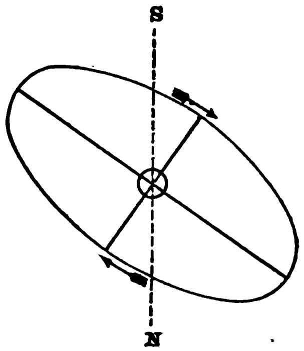
APPARENT ORBITS OF THE SATELLITES OF URANUS IN 1887,
AS SEEN IN AN INVERTING TELESCOPE.

WASHINGTON MEAN TIMES OF ELONGATIONS.

ARIEL.						UMBRIEL.						TITANIA.						OBERON.			
North.			South.			North.			South.			North.			South.			North and South.			
	d	h		d	h		d	h		d	h		d	h		d	h		d	h	
Jan.	0	22.0	Jan.	2	4.2				Jan.	1	6.9	Jan.	2	12.4	Jan.	6	20.9	Jan.	5	2.0	S.
	8	11.5		9	17.7	Jan.	7	12.1		9	13.8		11	5.3		15	13.8		11	19.6	N.
	16	0.9		17	7.2		15	19.0		17	20.7		19	22.2		24	6.7		18	13.1	S.
	23	14.4		24	20.6		24	1.9		26	3.6		28	15.2	Feb.	1	23.6		25	6.6	N.
	31	3.9	Feb.	1	10.1	Feb.	1	8.8	Feb.	3	10.5	Feb.	6	8.1		10	16.5	Feb.	1	0.2	S.
Feb.	7	17.3		8	23.6		9	15.7		11	17.4		15	1.0		19	9.5		7	17.7	N.
	15	6.8		16	13.0		17	22.6		20	0.3		23	17.9		28	2.4		14	11.3	S.
	22	20.2		24	2.5		26	5.5		28	7.2	Mar.	4	10.8	Mar.	8	19.3		21	4.8	N.
Mar.	2	9.6	Mar.	3	15.9	Mar.	6	12.4	Mar.	8	14.1		13	3.8		17	12.2		27	22.3	S.
	9	23.1		11	5.4		14	19.3		16	21.0		21	20.7		26	5.2	Mar.	6	15.9	N.
	17	12.6		18	18.8		23	2.2		25	3.9		30	13.6	Apr.	3	22.1		13	9.4	S.
	25	2.0		26	8.3		31	9.1	Apr.	2	10.8	Apr.	8	6.5		12	15.0		20	2.9	N.
Apr.	1	15.5	Apr.	2	21.8	Apr.	8	16.0		10	17.8		16	23.5		21	8.0		26	20.5	S.
	9	5.0		10	11.2		16	22.9		19	0.7		25	16.4		30	0.9	Apr.	2	14.0	N.
	16	18.4		18	0.7		25	5.9		27	7.6	May	4	9.4	May	8	17.8		9	7.6	S.
	24	7.9		25	14.2	May	3	12.8	May	5	14.5		13	2.3		17	10.8		16	1.1	N.
May	1	21.4	May	3	3.6		11	19.7		13	21.4		21	19.3		26	3.7		22	18.7	S.
	9	10.8		10	17.1		20	2.6		22	4.4		30	12.2	June	3	20.7		29	12.2	N.
	17	0.3		18	6.5		28	9.6		30	11.3	June	8	5.2		12	13.6	May	6	5.8	S.
	24	13.8		25	20.0	June	5	16.5	June	7	18.2		16	22.1		21	6.6		12	23.4	N.
June	1	3.3	June	2	9.5		13	23.5		16	1.2		25	15.1		29	23.5		19	16.9	S.
	8	16.7		9	23.0		22	6.4		24	8.1	July	4	8.0	July	8	16.5		26	10.5	N.
	16	6.2		17	12.5		30	13.3	July	2	15.1		13	1.0		17	9.4	June	2	4.0	S.
	23	19.7		25	1.9	July	8	20.2		10	22.0								8	21.6	N.
July	1	9.2	July	2	15.4														15	15.1	S.

	d	h		d	h
Period of Ariel,	2	12.489	Period of Titania,	8	16.942
Period of Umbriel,	4	3.460	Period of Oberon,	13	11.119

NOTE.—For Ariel only every third elongation is given, and for Umbriel every alternate one. The intermediate ones may be found by adding multiples of the period of the satellite.



Date.	Position Angle.	Apparent Distance.
Jan. 14,	232°.8	16″.7
Sept. 18,	235.0	16.7
Nov. 16,	234.8	17.0

APPARENT ORBIT OF THE SATELLITE OF NEPTUNE IN 1887, *AS SEEN IN AN INVERTING TELESCOPE.*

WASHINGTON MEAN TIMES OF ELONGATIONS.

South West.		North East.		South West.		North East.		South West.		North East.	
	d h		d h		d h		d h		d h		d h
Jan.	2 17.1	Jan.	5 15.7	Aug.	31 15.5	Sept.	3 14.0	Nov.	4 6.7	Nov.	7 5.2
	8 14.2		11 12.7	Sept.	6 12.5		9 11.0		10 3.7		13 2.2
	14 11.2		17 9.7		12 9.5		15 8.1		16 0.8		18 23.3
	20 8.3		23 6.8		18 6.5		21 5.1		21 21.8		24 20.3
	26 5.3		29 3.8		24 3.6		27 2.1		27 18.8		30 17.4
Feb.	1 2.3	Feb.	4 0.9		30 0.6	Oct.	2 23.1	Dec.	3 15.9	Dec.	6 14.4
	6 23.4		9 21.9	Oct.	5 21.6		8 20.1		9 12.9		12 11.4
	12 20.4		15 19.0		11 18.6		14 17.1		15 9.9		18 8.5
	18 17.5		21 16.0		17 15.6		20 14.2		21 7.0		24 5.5
	24 14.5		27 13.0		23 12.7		26 11.2		27 4.0		30 2.5
Mar.	2 11.6	Mar.	5 10.1		29 9.7	Nov.	1 8.2		33 1.0		35 23.6

The above times are those of each passage of the satellite through an apsis of its apparent orbit. The position of the satellite at any other time may be found by measuring around the orbit from the apsis last passed through, remembering that the radius vector of the satellite describes equal areas in equal times.

Period of the satellite of Neptune, $5^d\ 21^h.045$.

In the above diagrams, the central circle represents the planet, and is on the same scale as the orbits.

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

	d	h	m			°	'
Jan.	2	3	-	⊙	Perigee.		
	2	7	-	□ ♅ ⊙			
	5	5	36	☌ ♆ ☽	.... ♆ +	3	30
	6	6	-	☿	in ☋		
	8	12	-	♀	in Aphelion.		
	8	21	-	☍ ♄ ⊙			
	9	5	29	☌ ♄ ☽	.... ♄ +	3	7
	14	20	39	☌ ♅ ☽	.... ♅ −	3	5
	16	3	-	♂	in Perihelion.		
	16	4	-	♅	Stationary.		
	16	9	49	☌ ♃ ☽	.... ♃ −	3	39
	16	11	-	☿	in Aphelion.		
	22	15	18	☌ ☿ ☽	.... ☿ −	4	38
	24	10	-	□ ♃ ⊙			
	24	14	52	☌ ♀ ☽	.... ♀ −	2	27
	25	6	7	☌ ♂ ☽	.... ♂ −	1	18
	31	7	-	♀	greatest Hel. Lat. S.		
Feb.	1	14	13	☌ ♆ ☽	.... ♆ +	3	39
	4	19	-	♆	Stationary.		
	5	12	53	☌ ♄ ☽	.... ♄ +	3	22
	5	17	-	☌ ♄	δ Geminorum ♄ +	0	4
	5	19	-	☿	greatest Hel. Lat. S.		
	6	17	-	☌ ☿ ⊙	Superior.		
	7	-	-	☽	eclip'd, partly vis. at Wash.		
	9	7	-	☌ ♂ ♀	.... ♂ +	0	34
	11	3	46	☌ ♅ ☽	.... ♅ −	3	9
	12	19	5	☌ ♃ ☽	.... ♃ −	3	43
	13	9	-	□ ♆ ⊙			
	18	14	-	♃	Stationary.		
	22	-	-	⊙	eclipsed, invis. at Wash.		
	22	23	-	☌ ☿ ♂	.... ☿ +	0	32
	23	9	27	☌ ♂ ☽	.... ♂ +	1	4
	23	10	22	☌ ☿ ☽	.... ☿ +	1	43
	24	0	13	☌ ♀ ☽	.... ♀ +	1	17
	24	20	-	☿	in ☊		
	28	22	1	☌ ♆ ☽	.... ♆ +	3	41
Mar.	1	10	-	☿	in Perihelion.		
	4	21	0	☌ ♄ ☽	.... ♄ +	3	29
	4	23	-	☿	greatest elong. E.	18	14
	10	12	43	☌ ♅ ☽	.... ♅ −	3	2
	11	18	-	☿	greatest Hel. Lat. N.		
	12	0	-	☿	Stationary.		
	12	3	7	☌ ♃ ☽	.... ♃ −	3	33
	14	14	-	☌ ☿ ♂	.... ☿ +	4	43
	16	24	-	♄	Stationary.		
	20	5	-	⊙	enters ♈, Spring com.		
	21	9	-	☌ ☿ ⊙	Inferior.		
	23	9	27	☌ ☿ ☽	.... ☿ +	5	57
	24	11	42	☌ ♂ ☽	.... ♂ +	3	10
	26	7	6	☌ ♀ ☽	.... ♀ +	4	50
	28	5	12	☌ ♆ ☽	.... ♆ +	3	35
	28	14	-	♀	in ☊		
	30	19	-	☍ ♅ ⊙			
Apr.	1	5	6	☌ ♄ ☽	.... ♄ +	3	23
Apr.	4	5	-	☿	in ☋		
	4	6	-	☿	Stationary.		
	5	8	-	□ ♄ ⊙			
	6	22	11	☌ ♅ ☽	.... ♅ −	2	57
	8	9	37	☌ ♃ ☽	.... ♃ −	3	21
	14	9	-	☿	in Aphelion.		
	15	0	-	☌ ♆ ♀	.... ♆ −	2	35
	16	23	-	♄	in ☊		
	17	5	-	☿	greatest elong. W.	27	26
	20	3	49	☌ ☿ ☽	.... ☿ +	0	31
	20	17	-	☍ ♃ ⊙			
	22	13	12	☌ ♂ ☽	.... ♂ +	4	35
	24	6	-	☌ ♂ ⊙			
	24	12	40	☌ ♆ ☽	.... ♆ +	3	28
	24	19	-	☌ ♄	δ Geminorum ♄ +	0	12
	25	13	6	☌ ♀ ☽	.... ♀ +	6	18
	28	13	32	☌ ♄ ☽	.... ♄ +	3	6
	30	22	-	♀	in Perihelion.		
May	4	6	24	☌ ♅ ☽	.... ♅ −	2	58
	4	20	-	☿	greatest Hel. Lat. S.		
	5	14	56	☌ ♃ ☽	.... ♃ −	3	14
	18	2	-	☌ ♆ ⊙			
	19	7	-	♂	in ☊		
	21	11	-	☌ ☿ ♂	.... ☿ −	0	28
	21	13	57	☌ ♂ ☽	.... ♂ +	5	11
	21	14	22	☌ ☿ ☽	.... ☿ +	4	46
	21	21	13	☌ ♆ ☽	.... ♆ +	3	26
	23	1	-	♀	greatest Hel. Lat. N.		
	23	7	-	☌ ♆ ☿	.... ♆ −	1	36
	23	19	-	☿	in ☊		
	25	14	51	☌ ♀ ☽	.... ♀ +	5	18
	25	23	24	☌ ♄ ☽	.... ♄ +	2	45
	26	21	-	☌ ☿ ⊙	Superior.		
	27	0	-	☌ ♆ ♂	.... ♆ −	1	47
	28	9	-	☿	in Perihelion.		
	30	0	-	☌ ♄ ♀	.... ♄ −	2	15
	31	12	46	☌ ♅ ☽	.... ♅ −	3	9
June	1	18	55	☌ ♃ ☽	.... ♃ −	3	22
	7	18	-	☿	greatest Hel. Lat. N.		
	16	19	-	♅	Stationary.		
	18	6	54	☌ ♆ ☽	.... ♆ +	3	29
	19	13	32	☌ ♂ ☽	.... ♂ +	5	1
	20	4	-	☌ ☿ ♄	.... ☿ +	1	34
	21	1	-	⊙	enters ♋, Summer com.		
	22	11	32	☌ ♄ ☽	.... ♄ +	2	26
	22	12	-	♃	Stationary.		
	22	17	17	☌ ☿ ☽	.... ☿ +	3	27
	24	6	50	☌ ♀ ☽	.... ♀ +	2	1
	27	18	8	☌ ♅ ☽	.... ♅ −	3	23
	28	23	56	☌ ♃ ☽	.... ♃ −	3	40
	29	20	-	□ ♅ ⊙			
	30	17	-	☿	greatest elong. E.	25	51
July	1	4	-	☿	in ☋		
	1	16	-	⊙	Apogee.		

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

	d	h	m		°	′
July	4	10	-	☌ ♀ α Leonis . . . ♀ —	1	14
	11	9	-	☿ in Aphelion.		
	13	12	-	♀ greatest elong. E.	45	33
	14	22	-	☿ Stationary.		
	15	17	5	☌ ♆ ☽ . . . . ♆ +	3	35
	18	4	-	♀ in ☋		
	18	11	-	☌ ♄ ☉		
	18	11	23	☌ ♂ ☽ . . . . ♂ +	4	18
	19	8	-	□ ♃ ☉		
	20	1	58	☌ ♄ ☽ . . . . ♄ +	2	10
	21	0	1	☌ ☿ ☽ . . . . ☿ —	3	40
	23	10	40	☌ ♀ ☽ . . . . ♀ —	3	8
	25	0	40	☌ ♅ ☽ . . . . ♅ —	3	35
	26	7	50	☌ ♃ ☽ . . . . ♃ —	3	59
	28	12	-	☌ ☿ ☉ Inferior.		
	31	18	-	☿ greatest Hel. Lat. S.		
Aug.	3	-	-	☽ eclipsed, invis. at Wash.		
	7	16	-	☿ Stationary.		
	12	2	38	☌ ♆ ☽ . . . . ♆ +	3	36
	15	-	-	♀ greatest brilliancy.		
	16	1	-	☿ greatest elong. W.	18	38
	16	6	49	☌ ♂ ☽ . . . . ♂ +	3	10
	16	17	46	☌ ♄ ☽ . . . . ♄ +	1	56
	17	3	46	☌ ☿ ☽ . . . . ☿ +	0	33
	18	-	-	☉ eclipsed, invis. at Wash.		
	19	18	-	☿ in ☊		
	20	21	2	☌ ♀ ☽ . . . . ♀ —	9	13
	21	6	-	♀ in Aphelion.		
	21	9	54	☌ ♅ ☽ . . . . ♅ —	3	41
	22	19	57	☌ ♃ ☽ . . . . ♃ —	4	12
	22	20	-	□ ♆ ☉		
	24	8	-	☿ in Perihelion.		
	28	0	-	☌ ♂ ♄ . . . . ♂ +	0	49
	30	18	-	☌ ☿ α Leonis . . . ☿ +	1	13
	31	4	-	♀ Stationary.		
Sept.	2	7	-	♆ Stationary.		
	3	17	-	☿ greatest Hel. Lat. N.		
	8	10	28	☌ ♆ ☽ . . . . ♆ +	3	30
	10	1	-	☌ ☿ ☉ Superior.		
	13	0	-	♀ greatest Hel. Lat. S.		
	13	9	14	☌ ♄ ☽ . . . . ♄ +	1	39
	14	0	28	☌ ♂ ☽ . . . . ♂ +	1	48
	15	8	-	☌ ☿ ♀ . . . . ☿ +	10	44
	16	22	52	☌ ♀ ☽ . . . . ♀ —	12	50
	17	5	20	☌ ☿ ☽ . . . . ☿ —	2	33
	17	22	7	☌ ♅ ☽ . . . . ♅ —	3	43
	19	12	24	☌ ♃ ☽ . . . . ♃ —	4	18
	20	23	-	☌ ♀ ☉ Inferior.		
	22	16	-	☉ enters ♎, Autumn com.		
	24	1	-	☌ ♅ ☿ . . . . ♅ +	0	20
	27	3	-	☿ in ☋		
	29	20	-	☌ ☿ α Virginis . . ☿ +	1	52
Oct.	5	16	17	☌ ♆ ☽ . . . . ♆ +	3	19
Oct.	5	18	-	☌ ♅ ☉		
	7	8	-	☿ in Aphelion.		
	10	7	-	☌ ♂ α Leonis . . . ♂ +	0	59
	10	22	14	☌ ♄ ☽ . . . . ♄ +	1	20
	12	6	-	♀ Stationary.		
	12	15	14	☌ ♂ ☽ . . . . ♂ +	0	19
	13	15	-	☌ ☿ ♃ . . . . ☿ —	2	59
	13	20	26	☌ ♀ ☽ . . . . ♀ —	7	52
	15	11	50	☌ ♅ ☽ . . . . ♅ —	3	49
	17	8	6	☌ ♃ ☽ . . . . ♃ —	4	19
	17	15	23	☌ ☿ ☽ . . . . ☿ —	7	39
	25	13	-	☌ ♃ α² Libræ . . . ♃ +	0	34
	26	15	-	☿ greatest elong. E.	23	58
	27	17	-	☿ greatest Hel. Lat. S.		
	28	-	-	♀ greatest brilliancy.		
	29	5	-	□ ♄ ☉		
Nov.	1	21	55	☌ ♆ ☽ . . . . ♆ +	3	11
	6	6	-	☿ Stationary.		
	7	7	10	☌ ♄ ☽ . . . . ♄ +	1	1
	8	6	-	♀ in ☊		
	8	9	-	☌ ♃ ☉		
	10	3	4	☌ ♂ ☽ . . . . ♂ —	1	5
	11	7	36	☌ ♀ ☽ . . . . ♀ —	3	42
	12	0	55	☌ ♅ ☽ . . . . ♅ —	4	0
	14	5	8	☌ ♃ ☽ . . . . ♃ —	4	18
	14	21	40	☌ ☿ ☽ . . . . ☿ —	5	17
	15	18	-	☿ in ☊		
	17	2	-	☌ ☿ ☉ Inferior.		
	17	8	-	♄ Stationary.		
	20	8	-	☿ in Perihelion.		
	20	13	-	♂ greatest Hel. Lat. N.		
	20	13	-	☍ ♆ ☉		
	22	7	-	☌ ☿ ♃ . . . . ☿ +	1	7
	23	17	-	☌ ♅ ♀ . . . . ♅ —	1	7
	26	7	-	☿ Stationary.		
	29	1	50	☌ ♆ ☽ . . . . ♆ +	3	11
	30	16	-	☿ greatest Hel. Lat. N.		
Dec.	2	11	-	♀ greatest elong. W.	46	49
	3	18	-	☌ ☿ ♃ . . . . ☿ +	1	35
	4	12	13	☌ ♄ ☽ . . . . ♄ +	0	51
	5	23	-	☿ greatest elong. W.	20	36
	8	11	27	☌ ♂ ☽ . . . . ♂ —	2	10
	9	10	59	☌ ♅ ☽ . . . . ♅ —	4	18
	10	14	55	☌ ♀ ☽ . . . . ♀ —	2	37
	11	19	-	♀ in Perihelion.		
	12	1	8	☌ ♃ ☽ . . . . ♃ —	4	16
	12	15	37	☌ ☿ ☽ . . . . ☿ —	3	24
	21	10	-	☉ enters ♑, Winter com.		
	24	3	-	☿ in ☋		
	25	14	-	♂ in Aphelion.		
	26	8	4	☌ ♆ ☽ . . . . ♆ +	3	18
	31	13	-	☉ Perigee.		
	31	15	45	☌ ♄ ☽ . . . . ♄ +	0	55

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West. Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Åbo	+ 60 26 56.8	— 9 53.5	9.998902	— 6 37 18.50	— 1 29 6.41
Adelaide	— 34 57	+ 10 47.8	9.999526	—14 22 33.1	— 9 14 21.0
Albany	+ 42 39 49.5	— 11 28.2	9.999336	— 0 13 12.87	+ 4 54 59.22
Alfred	+ 42 15 19.8	— 11 27.2	9.999346	+ 0 2 55.00	+ 5 11 7.09
Algier	+ 36 45 2.7	— 11 1.6	9.999483	— 5 20 23.48	— 0 12 11.39
Allegheny	+ 40 27 41.6	— 11 21.6	9.999391	+ 0 11 50.84	+ 5 20 2.93
Altona	+ 53 32 45.3	— 11 0.8	9.999063	— 5 47 58.44	— 0 39 46.35
Amherst	+ 42 22 15.6	— 11 27.5	9.999343	— 0 18 4.8	+ 4 50 7.3
Annapolis	+ 38 58 53.5	— 11 15.0	9.999428	— 0 2 15.60	+ 5 5 56.49
Ann Arbor	+ 42 16 48.0	— 11 27.3	9.999346	+ 0 26 43.10	+ 5 34 55.19
Armagh	+ 54 21 12.7	— 10 54.9	9.999043	— 4 41 36.6	+ 0 26 35.5
Athens	+ 37 58 20.0	— 11 9.4	9.999453	— 6 43 7.8	— 1 34 55.7
Berlin	+ 52 30 16.7	— 11 7.7	9.999088	— 6 1 47.00	— 0 53 34.91
Berne	+ 46 57 8.7	— 11 29.2	9.999227	— 5 37 58.1	— 0 29 46.0
Bethlehem	+ 40 36 23.9	— 11 22.2	9.999388	— 0 6 40.19	+ 5 1 31.90
Birr Castle	+ 53 5 47.0	— 11 3.9	9.999074	— 4 36 31.2	+ 0 31 40.9
Bologna	+ 44 29 47.0	— 11 30.5	9.999289	— 5 53 36.7	— 0 45 24.6
Bonn	+ 50 43 45.0	— 11 17.3	9.999132	— 5 36 35.38	— 0 28 23.29
Bothkamp	+ 54 12 9.6	— 10 56.0	9.999047	— 5 48 42.9	— 0 40 30.8
Breslau	+ 51 6 56.5	— 11 15.4	9.999122	— 6 16 20.80	— 1 8 8.71
Brussels	+ 50 51 10.5	— 11 16.8	9.999129	— 5 25 40.7	— 0 17 28.6
Cambridge (*England*)	+ 52 12 51.6	— 11 9.4	9.999095	— 5 8 34.84	— 0 0 22.75
Cambridge (*Mass.*)	+ 42 22 48.3	— 11 27.6	9.999343	— 0 23 41.11	+ 4 44 30.98
Cape of Good Hope	— 33 56 3.4	+ 10 39.0	9.999550	— 6 22 7.1	— 1 13 55.0
Chapultepec	+ 19 25 17.5	— 7 12.0	9.999841	+ 1 28 26.15	+ 6 36 38.24
Charkow	+ 50 0 10.2	— 11 20.5	9.999150	— 7 33 6.8	— 2 24 54.7
Chicago	+ 41 50 1.0	— 11 26.2	9.999357	+ 0 42 14.69	+ 5 50 26.78
Christiania	+ 59 54 43.7	— 10 0.2	9.998914	— 5 51 5.94	— 0 42 53.85
Cincinnati (*New Obs.*)	+ 39 8 35.5	— 11 15.8	9.999424	+ 0 29 29.33	+ 5 37 41.42
Cincinnati (*Old Obs.*)	+ 39 6 26.5	— 11 15.6	9.999425	+ 0 29 46.85	+ 5 37 58.94
Clinton	+ 43 3 17.0	— 11 28.9	9.999326	— 0 6 34.65	+ 5 1 37.44
Coimbra	+ 40 12 25.8	— 11 20.6	9.999398	— 4 34 37.6	+ 0 33 34.5
Copenhagen	+ 55 41 13.6	— 10 43.9	9.999011	— 5 58 31.3	— 0 50 19.2
Cordoba	— 31 25 15.4	+ 10 13.5	9.999608	— 0 51 27.0	+ 4 16 45.1
Cracow	+ 50 3 50.0	— 11 20.3	9.999149	— 6 28 2.46	— 1 19 50.37
Dantzig	+ 54 21 18.0	— 10 54 9	9.999043	— 6 22 51.4	— 1 14 39.3
Dorpat	+ 58 22 47.4	— 10 17.6	9.998948	— 6 55 5.6	— 1 46 53 5
Dublin	+ 53 23 13	— 11 1.9	9.999066	— 4 42 50	+ 0 25 22
Düsseldorf	+ 51 12 25	— 11 15.0	9.999120	— 5 35 17	— 0 27 5
Dun Echt	+ 57 9 36	— 10 30.2	9.998977	— 4 58 32.1	+ 0 9 40.0
Durham	+ 54 46 6.2	— 10 51.6	9.999033	— 5 1 52.3	+ 0 6 19.8
Edinburgh	+ 55 57 23.2	— 10 41.5	9.999005	— 4 55 29.04	+ 0 12 43.05
Florence	+ 43 46 4.1	— 11 29.9	9.999308	— 5 53 13.6	— 0 45 1.5
Geneva	+ 46 11 58.8	— 11 30.1	9.999246	— 5 32 48.86	— 0 24 36.77
Georgetown	+ 38 54 26.2	— 11 14.6	9.999430	+ 0 0 6.20	+ 5 8 18.29
Glasgow (*Missouri*)	+ 39 16 16.8	— 11 16.4	9.999421	+ 1 3 5.93	+ 6 11 18.02
Glasgow (*Scotland*)	+ 55 52 42.8	— 10 42.2	9.999006	— 4 51 1.5	+ 0 17 10.6

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Göttingen	+ 51 31 47.9	− 11 13.3	9.999112	− 5 47 58.33	− 0 39 46.24
Gotha	+ 50 56 37.5	− 11 16.3	9.999127	− 5 51 2.62	− 0 42 50.53
Greenwich	+ 51 28 38.4	− 11 13.6	9.999113	− 5 8 12.09	0 0 0
Hamburg	+ 53 33 7.0	− 11 0.8	9.999062	− 5 48 5.8	− 0 39 53.7
Hanover	+ 43 42 15	− 11 29.8	9.999309	− 0 19 4.13	+ 4 49 7.96
Hastings-on-Hudson	+ 40 59 25	− 11 23.6	9.999378	− 0 12 42.4	+ 4 55 29.7
Haverford	+ 40 0 36.5	− 11 19.8	9.999402	− 0 6 59.34	+ 5 1 12.75
Helsingfors	+ 60 9 43.3	− 9 57.1	9.998909	− 6 48 1.25	− 1 39 49.16
Hudson	+ 41 14 42.6	− 11 24.4	9.999371	+ 0 17 32.06	+ 5 25 44.15
Kasan	+ 55 47 24.2	− 10 43.0	9.999009	− 8 24 41.0	− 3 16 28.9
Kew	+ 51 28 6	− 11 13.6	9.999114	− 5 6 57.0	+ 0 1 15.1
Kiel	+ 54 20 29.7	− 10 55.0	9.999043	− 5 48 47.85	− 0 40 35.76
Kiew	+ 50 27 11.1	− 11 18.6	9.999139	− 7 10 12.73	− 2 2 0.64
Königsberg	+ 54 42 50.6	− 10 52.0	9.999034	− 6 30 11.00	− 1 21 58.91
Kremsmünster	+ 48 3 23.7	− 11 27.0	9.999199	− 6 4 44.3	− 0 56 32.2
Leiden	+ 52 9 20.0	− 11 9.8	9.999097	− 5 26 8.44	− 0 17 56.35
Leipzig	+ 51 20 6.3	− 11 14.3	9.999117	− 5 57 46.11	− 0 49 34.02
Leyton	+ 51 34 34	− 11 13.0	9.999111	− 5 8 11.22	+ 0 0 0.87
Lisbon (*Marine Obs.*)	+ 38 42 17.6	− 11 13.5	9.999435	− 4 31 47.1	+ 0 36 25.0
Lisbon (*Royal Obs.*)	+ 38 42 31.3	− 11 13.6	9.999435	− 4 31 27.41	+ 0 36 44.68
Liverpool	+ 53 24 4	− 11 1.8	9.999066	− 4 55 54.9	+ 0 12 17.2
Lübec	+ 53 51 31.2	− 10 58.6	9.999055	− 5 50 57.64	− 0 42 45.55
Lund	+ 55 41 52.1	− 10 43.8	9.999011	− 6 0 57.11	− 0 52 45.02
Madison	+ 43 4 36.7	− 11 28.9	9.999325	+ 0 49 25.80	+ 5 57 37.9
Madras	+ 13 4 8.1	− 5 3.3	9.999926	−10 29 11.5	− 5 20 59.4
Madrid	+ 40 24 30.0	− 11 21.4	9.999393	− 4 53 26.7	+ 0 14 45.4
Manheim	+ 49 29 11.0	− 11 22.5	9.999163	− 5 42 2.61	− 0 33 50.52
Marburg	+ 50 48 46.9	− 11 16.9	9.999130	− 5 43 17.1	− 0 35 5.0
Markree	+ 54 10 31.8	− 10 56.2	9.999047	− 4 34 23.7	+ 0 33 48.4
Marseilles	+ 43 18 19.1	− 11 29.3	9.999320	− 5 29 46.73	− 0 21 34.64
Melbourne	− 37 49 53.3	+ 11 8.6	9.999456	−14 48 6.9	− 9 39 54.8
Mexico	+ 19 26 1.3	− 7 12.2	9.999840	+ 1 28 14.58	+ 6 36 26.67
Milan	+ 45 27 59.2	− 11 30.6	9.999265	− 5 44 58.06	− 0 36 45.97
Modena	+ 44 38 52.8	− 11 30.6	9.999285	− 5 51 54.9	− 0 43 42.8
Montsouris	+ 48 49 18.0	− 11 24.8	9.999180	− 5 17 32.77	− 0 9 20.68
Moscow	+ 55 45 19.8	− 10 43.3	9.999009	− 7 38 29.0	− 2 30 16.9
Mount Hamilton	+ 37 21 3	− 11 5.6	9.999468	+ 2 58 14.6	+ 8 6 26.7
Munich	+ 48 8 45.5	− 11 26.7	9.999197	− 5 54 38.22	− 0 46 26.13
Naples	+ 40 51 45.4	− 11 23.1	9.999381	− 6 5 13.0	− 0 57 0.9
Neuchatel	+ 46 59 51.0	− 11 29.1	9.999226	− 5 36 2.3	− 0 27 50.2
New Haven	+ 41 18 36.5	− 11 24.6	9.999370	− 0 16 29.90	+ 4 51 42.19
New York (*Columb. Coll.*)	+ 40 45 23.1	− 11 22.7	9.999384	− 0 12 18.40	+ 4 55 53.69
New York (RUTHERFURD)	+ 40 43 48.5	− 11 22.6	9.999384	− 0 12 15.47	+ 4 55 56.62
Nicolaeff	+ 46 58 20.6	− 11 29.2	9.999226	− 7 16 6.2	− 2 7 54.1
Odessa	+ 46 28 36	− 11 29.8	9.999239	− 7 11 14.4	− 2 3 2.3
Ogden	+ 41 13 8.6	− 11 24.3	9.999372	+ 2 19 47.52	+ 7 27 59.61
Ó-Gyalla	+ 47 52 43.4	− 11 27.4	9.999204	− 6 20 57.68	− 1 12 45.59

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude From Washington.	Longitude From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Olmütz . . .	+ 49 35 43	– 11 22.1	9.999160	– 6 17 14.7	– 1 9 2.6
Oxford (*Radcliffe*) .	+ 51 45 36.0	– 11 12.0	9.999106	– 5 3 9.5	+ 0 5 2.6
Oxford (*University*) .	+ 51 45 34.2	– 11 12.0	9.999106	– 5 3 11.69	+ 0 5 0.40
Padua . . .	+ 45 24 2.5	– 11 30.6	9.999266	– 5 55 41.22	– 0 47 29.13
Palermo . . .	+ 38 6 44	– 11 10.2	9.999449	– 6 1 37.1	– 0 53 25.0
Paramatta . .	– 33 48 49.8	+ 10 37.8	9.999553	– 15 12 18.3	– 10 4 6.2
Paris . . .	+ 48 50 11.8	– 11 24.8	9.999179	– 5 17 33.11	– 0 9 21.02
Philadelphia . .	+ 39 57 7.5	– 11 19.5	9.999404	– 0 7 33.64	+ 5 0 38.45
Pola . . .	+ 44 51 49.0	– 11 30.6	9.999280	– 6 3 35.27	– 0 55 23.18
Potsdam . . .	+ 52 22 56	– 11 8.4	9.999091	– 6 0 29	– 0 52 17
Poughkeepsie . .	+ 41 41 18	– 11 25.8	9.999360	– 0 12 38.5	+ 4 55 33.6
Prague . . .	+ 50 5 18.8	– 11 20.2	9.999148	– 6 5 53.5	– 0 57 41.4
Princeton . .	+ 40 20 57.8	– 11 21.2	9.999394	– 0 9 34.54	+ 4 58 37.55
Pulkowa . . .	+ 59 46 18.7	– 10 1.8	9.998917	– 7 9 30.76	– 2 1 18.67
Quebec . . .	+ 46 48 17.3	– 11 29.4	9.999231	– 0 23 22.8	+ 4 44 49.3
Rio de Janeiro . .	– 22 54 23.8	+ 8 14.0	9.999782	– 2 15 30.68	+ 2 52 41.41
Rochester . .	+ 43 8 15	– 11 29.0	9.999324	+ 0 3 8	+ 5 11 20
Rome . . .	+ 41 53 53.7	– 11 26.3	9.999355	– 5 58 6.79	– 0 49 54.70
Saint Petersburg .	+ 59 56 29.7	– 9 59.8	9.998913	– 7 9 25.6	– 2 1 13.5
San Fernando . .	+ 36 27 41.5	– 10 59.5	9.999490	– 4 43 22.5	+ 0 24 49.6
Santiago de Chile .	– 33 26 42.0	+ 10 34.4	9.999561	– 0 25 29.7	+ 4 42 42.4
Schwerin . . .	+ 53 37 38.2	– 11 0.2	9.999061	– 5 53 52.8	– 0 45 40.7
Senftenberg . .	+ 50 5 10.1	– 11 20.2	9.999148	– 6 14 2.7	– 1 5 50.6
Speier . . .	+ 49 18 55.4	– 11 23.2	9.999167	– 5 41 57.7	– 0 33 45.6
Stockholm . .	+ 59 20 33.0	– 10 6.9	9.998927	– 6 20 26.09	– 1 12 14.00
Stonyhurst . .	+ 53 50 40	– 10 58.7	9.999055	– 4 58 19.41	+ 0 9 52.68
Strassburg (*New Obs.*)	+ 48 34 59.7	– 11 25.5	9.999186	– 5 39 16.74	– 0 31 4.65
Strassburg (*Old Obs.*)	+ 48 34 53.8	– 11 25.5	9.999186	– 5 39 14.58	– 0 31 2.49
Sydney . . .	– 33 51 41.1	+ 10 38.3	9.999552	– 15 13 2.7	– 10 4 50.6
Toulouse . . .	+ 43 36 47	– 11 29.7	9.999312	– 5 14 3.2	– 0 5 51.1
Turin . . .	+ 45 4 6.0	– 11 30.7	9.999275	– 5 39 0.5	– 0 30 48.4
Twickenham . .	+ 51 27 4.2	– 11 13.7	9.999114	– 5 6 59.0	+ 0 1 13.1
Upsala . . .	+ 59 51 31.5	– 10 0.8	9.998915	– 6 18 42.7	– 1 10 30.6
Utrecht . . .	+ 52 5 10.5	– 11 10.2	9.999098	– 5 28 43.8	– 0 20 31.7
Venice . . .	+ 45 25 49.5	– 11 30.6	9.999266	– 5 57 37.5	– 0 49 25.4
Vienna (*Josephstadt*)	+ 48 12 53.8	– 11 26.6	9.999195	– 6 13 37.4	– 1 5 25.3
Vienna (*New Obs.*) .	+ 48 13 55.4	– 11 26.5	9.999195	– 6 13 33.31	– 1 5 21.22
Vienna (*Old Obs.*) .	+ 48 12 35.5	– 11 26.6	9.999195	– 6 13 43 83	– 1 5 31.74
Warsaw . . .	+ 52 13 5.7	– 11 9.4	9.999095	– 6 32 19.5	– 1 24 7.4
Washington . .	+ 38 53 38.8	– 11 14.5	9.999430	0 0 0	+ 5 8 12.09
West Point . .	+ 41 23 31	– 11 24.9	9.999368	– 0 12 22.71	+ 4 55 49.38
Wilhelmshaven .	+ 53 31 52.0	– 11 0.9	9.999063	– 5 40 47.30	– 0 32 35.21
Williamstown (*Mass.*)	+ 42 42 49	– 11 28.3	9.999334	– 0 15 18.6	+ 4 52 53.5
Williamstown (*Victoria*)	– 37 52 7.2	+ 11 8.8	9.999455	– 14 47 50.9	– 9 39 38.8
Wilna . . .	+ 54 41 0	– 10 52.3	9.999035	– 6 49 24.0	– 1 41 11.9
Windsor . . .	– 33 36 28.9	+ 10 35.9	9.999558	– 15 11 33.8	– 10 3 21.7
Zürich . . .	+ 47 22 40.0	– 11 28.5	9.999216	– 5 42 24.7	– 0 34 12.6

ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

PART I—THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

THE greater portion of this Ephemeris, embracing the positions of the sun and moon; the distances of the moon from the centres of the sun and the four most conspicuous planets, and from certain fixed stars; the ephemerides of the planets Mercury, Venus, Mars, Jupiter, and Saturn, is designed for the special use of navigators. The remainder contains the ephemeris of Uranus and Neptune, the heliocentric co-ordinates of the seven major planets, the rectangular equatorial co-ordinates of the sun, the moon's longitude and latitude, data for the libration of the moon, the obliquity of the ecliptic, the equation of the equinoxes, etc.

TIME.

Astronomers make use of several different kinds of time: mean solar time; true, or apparent solar time, and sidereal time.

Solar Time.—Solar time is that used for all the purposes of ordinary life, and is measured by the daily motion of the sun. A *Solar Day* is the interval of time between two successive transits of the sun over the same meridian; and the hour-angle of the sun is called *Solar Time.* This is the most natural and direct measure of time. But the intervals between the successive returns of the sun to the same meridian are not exactly equal, owing to the varying motion of the earth around the sun, and to the obliquity of the ecliptic. The intervals between the sun's transits over the meridian being unequal, it is impossible to regulate a clock or chronometer so that it shall accurately follow the sun.

To avoid the irregularity which would arise from using the true sun as the measure of time, a fictitious sun, called the *Mean Sun,* is supposed to move in the equator with a uniform velocity. This mean sun is supposed to keep, on the average, as near the real sun as is consistent with perfect uniformity of motion; it is sometimes in advance of it, and sometimes behind it, the greatest deviation being about 16 minutes of time.

Mean Solar Time, which is perfectly equable in its increase, is measured by the motion of this mean sun. The clocks in ordinary use and the chronometers used by navigators are regulated to mean solar time.

True, or *Apparent Solar Time* is measured by the motion of the real sun.

The difference between apparent and mean time is called the *Equation of Time.* By means of it, we change apparent to mean time, or the reverse. Thus, if the apparent time be given, the mean time corresponding to it will be obtained by adding or subtracting the equation of time, according to the precept at the head of the column in which it is found, on page I of the Calendar for each month. If the mean time be given, the apparent time is obtained by applying the equation of time as directed by the precept on page II of the Calendar.

Sidereal Time.—Sidereal time is measured by the daily motion of the stars; or, as it is used by astronomers, by the daily motion of that point in the equator from which the true right ascension of the stars is counted. This point is the vernal equinox, and its hour-angle is called *Sidereal Time.* Astronomical clocks, regulated to sidereal time, are called sidereal clocks.

A *Sidereal Day* is the interval of time between the transit of the vernal equinox over any meridian, and its next succeeding return to the same meridian. It is about 3^m 56^s shorter than the mean solar day; 365¼ solar days, or a year, being divided into 366¼ sidereal days. It is divided into 24 hours. The sidereal hours are counted from 0 to 24, commencing with the instant of the passage of the true vernal equinox over the upper meridian, and ending with its return to the same meridian. About March 21st of each year the sidereal clock agrees with the mean time, or ordinary clock, and the former gains on the latter about 3^m 56^s per day, so that at the end of a year it will have gained an entire day, and will again agree with the mean time clock.

Day.—The *Civil Day*, according to the customs of society, commences at midnight, and comprises twenty-four hours from one midnight to the next following. The hours are counted from 0 to 12 from midnight to noon, after which they are again reckoned from 0 to 12 from noon to midnight. Thus the day is divided into two periods of 12 hours each, of which the first is marked A. M., and the last is marked P. M.

The *Astronomical Day* commences at noon on the civil day of the same date. It also comprises twenty-four hours, but they are reckoned from 0 to 24, and from the noon of one day to that of the next following. The astronomical as well as the civil time may be either apparent or mean, according as it is reckoned from apparent noon or from mean noon.

The civil day begins twelve hours before the astronomical day; therefore the first period of the civil day answers to the last part of the preceding astronomical day, and the last period of the civil day corresponds to the first part of the same astronomical day. Thus, January 9th, 2 o'clock, A. M., civil time, is January 8th, 14^h, astronomical time; and January 9th, 2 o'clock, P. M., civil time, is also January 9th, 2^h, astronomical time. The rule, then, for the transformation of civil time into astronomical time is this:—*If the civil time is marked A. M., take one from the day and add twelve to the hours, and the result is the astronomical time wanted; if the civil time is marked P. M., take away the designation P. M., and the astronomical time is had without further change.*

To change astronomical to civil time, we simply write P. M. after it, if it is less than 12 *hours. If greater than* 12 *hours, we subtract* 12 *hours from it, add* 1 *to the days, and write A. M.* For example, January 3d, 23 hours, astronomical time, is January 4th, 11 o'clock, A. M., civil time.

If the longitude from Greenwich be expressed in time, and, when *west*, *added* to the local time, or, when *east*, *subtracted* from the local time, the result is the corresponding Greenwich time. If the local mean time is used, the result is the Greenwich mean time, which ordinarily is that required for the use of this Ephemeris. The rule is the same, whether we use mean or sidereal time.

THE CALENDAR.

The Calendar is divided into twelve months, and to each month are assigned eighteen pages, the contents of which are as follow:—

Page I contains, for Greenwich apparent noon of each day, *The Sun's Apparent Right Ascension* and *Declination*, and the *Equation of Time.* Adjoining columns contain the differences of these quantities for one hour. By multiplying this difference by the hours and parts of an hour from Greenwich apparent noon, and adding the amount to, or subtracting it from, the quantity at noon, according as that quantity is increasing or decreasing, we obtain the value of any quantity for any given Greenwich apparent time. The hourly differences are given for the instant of apparent noon at Greenwich, and, when greater accuracy is required, should be first interpolated for half the hours and parts of an hour of the Greenwich apparent time.

This page is chiefly used when the sun is observed on the meridian, and the local apparent time is $0^h\,0^m\,0^s$. The longitude from Greenwich expressed in time, if west, is at that instant the Greenwich apparent time, or time after Greenwich apparent noon; if east, it is time before

Greenwich apparent noon. The longitude of any place is therefore employed in reducing the quantities on this page to apparent noon at the place.

The right ascension of the sun thus reduced is the sidereal time of local apparent noon. The difference between it and the clock time of the meridian passage of the sun is the error of the clock on sidereal time.

The declination of the sun reduced to the meridian, or apparent noon, of the place, is required in finding the latitude from a meridian altitude of the sun.

As an example of the use of page I: —

Let the sun's declination be required at apparent noon, 1887, May 30, at a place whose longitude is 180° 20′, or $12^h\ 1^m\ 20^s$ west from Greenwich.

		h	m	s
Local apparent time . . .	May 30,	0	0	0
Longitude from Greenwich (additive) . . .		12	1	20
Greenwich apparent time . . .	May 30,	12	1	20

Reducing the minutes and seconds to decimals of an hour, we find that this moment is $12^h.022$ after Greenwich apparent noon on May 30, or $11^h.978$ before Greenwich apparent noon on May 31.

On page 74 of the Ephemeris we find that the change of declination in one hour is

	″
May 30, at Greenwich apparent noon . . .	22.36
May 31, at Greenwich apparent noon . . .	21.41
Difference for one day	0.95

If we want to be very exact, we find the amount of this hourly difference for the time which is half way between Greenwich noon and the time of observation; that is, for 6 hours after Greenwich noon of the 30th. this being half of 12 hours. Six hours is 0.25 of a day; so the calculation is as follow: —

	″
Difference for one hour, May 30	22.36
Change for one day (or 0″.95) × 0.25 . . .	0.24
Difference at 6 hours after noon	22.12

$$22''.12 \times 12.022 = 265''.9 = 4'\,25''.9$$

		°	′	″
Declination at Greenwich noon, May 30 . . .	N.	21	46	0.4
Change in 12.022 hours (additive) . . .			4	25.9
Sun's declination at time of observation . . .	N.	21	50	26.3

When the time of observation is only a few hours before Greenwich noon, it may be better to count the longitude backward from this nearest noon. Thus, in the example just given, the time is $11^h.978$ before Greenwich noon of May 31; half this interval is about 0.25 of a day, and the hourly motion for the middle of the interval is 21″.67. Then, we find: —

		°	′	″
Declination at Greenwich noon, May 31 . .	N.	21	54	45.9
Product of 21″.67 × 11.978 = 259″.6 (subtractive) .			4	19.6
Sun's declination at time of observation . . .	N.	21	50	26.3

It will always be well to make the calculation by both methods, as their agreement will show both to be right.

At sea it is ordinarily sufficient to have the declination to the nearest half minute, and the reduction may be found by Table V of Bowditch's *American Practical Navigator*.

The equation of time, as has been before explained, is the number of minutes and seconds to be added to or subtracted from the apparent time, or the time given by an observation of the sun, to obtain the mean time. The heading of the column directs the manner in which the equation is to be applied. When there is a change in the course of the month from addition to subtraction or the reverse (as in the months of April and June), the two different directions are separated by a line, while a corresponding line below points out the dates between which the change takes place. The equation of time, as given on page I, is the mean time of apparent noon, or the hour-angle of the mean sun at that instant.

The Sun's Semidiameter and the *Sidereal Time of Semidiameter Passing Meridian* are also given on page I. The sun's semidiameter is used in reducing the altitude of the upper or lower limb of the sun to the altitude of the centre; and in reducing the angular distance of the limb from the moon or some other object, to the distance from the centre of the sun. The sidereal time of semidiameter passing the meridian is employed in obtaining the passage of the sun's centre over the wires of a transit-instrument, when the passage of one limb only has been observed. The quantity found in this column is to be added to the time of transit of the first, or western, limb; and to be subtracted from the time of transit of the second, or eastern, limb.

Page II contains, for Greenwich mean noon of each day, *The Sun's Apparent Right Ascension*, and *Declination*, the *Equation of Time* and the *Sidereal Time of Mean Noon.* The hourly changes of these quantities are also given, and may be used in reducing them to any Greenwich mean time. The hourly changes may be first interpolated for half the Greenwich time, when great precision is required, in the way described in explaining the calculation of the declination.

The right ascension and declination on pages I and II are affected by aberration, and therefore denote the *apparent* position of the *true* sun. Page II is more conveniently used when the mean time is known. This is the case in most observations of the sun out of the meridian, when the times have been noted by a clock or chronometer regulated to mean time. The quantities on this page can be reduced to mean noon of any place by interpolating for the longitude, as in the example of the sun's declination on the preceding page.

The sun's declination is required for finding the latitude of the place, the local time, and the sun's azimuth and amplitude, from observations of the sun.

The equation of time is needed in finding the mean time from observations of the sun, and the latitude from observations out of the meridian. The heading of the column directs the manner in which it is to be applied to mean time to obtain the apparent time.

The equation of time, as given on page II, is the apparent time of mean noon; and is equivalent to the hour-angle of the true sun at the instant of mean noon.

The sidereal time of mean noon is also the right ascension of the mean sun at Greenwich mean noon. It may be reduced for the longitude, or to any Greenwich mean time, by using the hourly difference, $9^{s}.8565$; or by Table III, appended to this volume, for reducing intervals of mean solar to sidereal time. Table LI of BOWDITCH's *Navigator* may be used for the same purpose when only the nearest quarter of a second is required.

The sun's right ascension and the sidereal time of mean noon, or right ascension of the mean sun, are useful in converting mean time to sidereal time. We first find the Greenwich mean time, then the R. A. of the mean sun for this time, as last explained: this being added to the local mean time will give the sidereal time.

The sidereal time of mean noon, reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time, gives the interval of sidereal time from noon. Subtracting from this the corresponding reduction of a sidereal interval to a mean time interval, in Table II, appended to this volume, or Table LII of BOWDITCH's *Navigator*, will give the mean time required. This reduction may also be found by multiplying $9^{s}.8296$ by the hours and parts of an hour of the given sidereal time.

As examples of the use of page II:—

1.—Let the sun's right ascension and the equation of time be required for 1887, May 15, 9^{h} 2^{m} 30^{s}, A. M., mean time, at a place whose longitude is 100° 10′, or 6^{h} 40^{m} 40^{s}, west of Greenwich.

		h	m	s	
Local astronomical mean time . . .	May 14,	21	2	30	
Longitude from Greenwich (additive) . .		6	40	40	
Greenwich mean time	May 15,	3	43	10	$=3^{h}.7194$

Sun's Right Ascension.

	h	m	s
May 15, Greenwich noon .	3	27	43.37
H. D. $9^{s}.872 \times 3.7194$ . .	+	0	36.72
	3	28	20.09

Equation of Time.

	m	s
May 15, noon . .	3	51.85 (additive).
H. D. — $0^{s}.016 \times 3.72$.	—	0.06
	3	51.79

In this case, the hourly differences interpolated to half the interval, or $1^{h}.9$ after noon, have been used.

The equation of time in this example is additive to mean time. Its reduction could also have been found by Table VI, A., of Bowditch's *Navigator*, but to seconds only.

2.—If the sidereal time is required for the same date and time, we have:—

	h	m	s
May 15, Sidereal Time (at Greenwich mean noon). . .	3	31	35.23
Hourly Difference $9^{s}.8565 \times 3.7194$	+	0	36.66
Add the local astronomical mean time	21	2	30.00
The required sidereal time is (rejecting 24^{h}) . . .	0	34	41.89

The reduction 0^{m} $36^{s}.66$ could have been found in Table III corresponding to the Greenwich mean time 3^{h} 43^{m} 10^{s}. Also, by Table LI of Bowditch's *Navigator*, the reduction is 0^{m} $36^{s}.7$.

3.—On 1887, May 15, A. M., at a place whose longitude is 109° 10′ W., suppose the sidereal time to be 0^{h} 36^{m} $37^{s}.16$, and that the corresponding mean time is required.

The astronomical day is May 14; the longitude in time, + 6^{h} 40^{m} 40^{s}, or + $6^{h}.678$.

	h	m	s
May 14, Sidereal Time (at Greenwich mean noon)	3	27	38.67
The H. D. $9^{s}.8565 \times 6.678$, or the reduction for 6^{h} 40^{m} 40^{s} in Table III .	+	1	5.82
The sidereal time of local mean noon	3	28	44.49
The given sidereal time (+ 24^{h}, if necessary for the following subtraction)	24	36	37.16
Subtracting the first from the second gives the sidereal interval from noon .	21	7	52.67 = $21^{h}.1313$
— $9^{s}.8296 \times 21.1313$, or the reduction for 21^{h} 7^{m} $52^{s}.67$ in Table II . .	—	3	27.71
The required astronomical mean time is . . May 14,	21	4	24.96

Page III contains, for Greenwich mean noon of each day, *The Sun's True Longitude and Latitude*, and the *Logarithm of the Radius Vector of the Earth.* The longitudes of the sun are the true longitudes, not corrected for aberration. The longitude is given in two columns, headed λ and λ'; λ representing the sun's longitude counted from the true equinox of the date; and λ', the same co-ordinate counted from the mean equinox of the beginning of the year, (January $0^{d}.0$). A column of hourly differences enables the computer to obtain the sun's longitude for any hour from noon. The hourly differences of the logarithm of the radius vector are likewise given. The latitude is referred to the ecliptic of the date.

The last column on page III contains the *Mean Time of Sidereal Noon;* that is, the number of hours, minutes and seconds after Greenwich mean noon when the first point of Aries passes the meridian of Greenwich. It may be reduced to any meridian by interpolating for the longitude, or to any Greenwich sidereal time by means of the hourly difference, — $9^{s}.8296$. The reduction, however, can be taken directly from Table II for reducing intervals of sidereal time to mean solar time; or, approximately, from Table LII Bowditch's *Navigator.*

This column may be used in converting sidereal time to mean time instead of that on page II. As an illustration, let us take Example 3, above.

It is seen in advance that the sum of the mean time of sidereal noon and the given sidereal time is less than 24 hours. Were it more than 24 hours, the mean time of sidereal noon should be taken out for May 13, that is the preceding astronomical day.

	h	m	s
May 14, the mean time of Greenwich sidereal noon is . .	20	28	59.43
The H. D. — $9^{s}.8296 \times 6.678$, or the reduction for long., Table II	—	1	5.64
The mean time of local sidereal noon	20	27	53.79
Add the given sidereal time	0	36	37.16 = $0^{h}.6103$
The sum is	21	4	30.95
— $9^{s}.8296 \times 0.6103$, or the reduction for 0^{h} 36^{m} $37^{s}.2$ in Table II .	—	0	6.00
The required astronomical mean time . May 14,	21	4	24.95

Page IV contains *The Moon's Semidiameter* and Equatorial *Horizontal Parallax*, for each mean noon and midnight at Greenwich. Columns adjoining those of the horizontal parallax give the change of this quantity in one hour, by means of which it can be reduced to any other Greenwich mean time, in the same way as the sun's declination and the equation of time in the preceding examples. The sign plus or minus prefixed to the hourly differences, shows whether the horizontal parallax is increasing or decreasing.

The reduction of the moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.272. It may also be obtained from Table XI of BOWDITCH'S *Navigator*, or by simply computing the proportional part.

If, for example, the semidiameter of the moon is to be taken out for 1887, Jan. 21, 10^h, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of Jan. 21 is $3''.8$; then,

$$\text{as } 12^h : 10^h = 3''.8 : 3''.16,$$

which is the correction to be subtracted from the semidiameter at noon, because the semidiameter is decreasing. The moon's semidiameter then, for Jan. 21, 10^h, is $15'\ 18''.6 - 3''.16$, or $15'\ 15''.4$.

The moon's semidiameter and horizontal parallax are required for all observations of the moon. When great precision is needed, the hourly differences should be first interpolated for half the interval of Greenwich time from noon or midnight, and a correction applied to the horizontal parallax for the latitude of the place of observation.

The *Mean Time of the Moon's Upper Transit at Greenwich*, which is given on page IV to tenths of a minute, is also accompanied with a column of differences for one hour of longitude, by means of which, having the longitude converted into time, the local time of the moon's meridian passage at any other place, may be computed. The reduction may be taken by simple inspection from BOWDITCH'S Table XXVIII. The last column of this page contains the *Age* of the moon, or the time elapsed since the preceding new moon, to tenths of a day.

Pages V—XII contain *The Moon's Right Ascension*, and *Declination*, for each day and hour of Greenwich mean time. They are accompanied with columns of differences for one minute, which are also given at each hour. The Greenwich mean time, which is required for taking out these quantities, may be taken from a well-regulated chronometer, or obtained by applying the longitude converted into time, to the local mean time of the observer. The right ascension or declination is taken out for the day and hour of the Greenwich mean time; the *Diff. for 1 Minute* multiplied by the minutes and parts of a minute of the Greenwich time, and the product added to, or subtracted from the quantity, according as the quantity is increasing or decreasing.

Thus, suppose the moon's right ascension and declination are required for 1887, Sept. 9, $10^h\ 10^m\ 30^s$, astronomical mean time at Greenwich:—

		Right Ascension.			*Declination.*
		h m s			° ′ ″
Sept. 9, 10^h		4 31 11.52			N. 16 55 6.2
Diff. $2^s.1055 \times 10.5$	=	+ 22.11	$5''.588 \times 10.5$	=	+ 58.7
Sept. 9, $10^h\ 10^m\ 30^s$		4 31 33.63			N. 16 56 4.9

The differences interpolated for $5^m.2 = 0^h.09$ are, for the right ascension $2^s.0062$, and for the declination $5''.575$, which may be used for greater precision.

Page XII contains also the *Phases of the Moon* and the dates of the *Moon's Perigee and Apogee*, or least and greatest distances from the earth.

Pages XIII—XVIII contain the *Lunar Distances*, or the angular distances of the centre of the moon from the centre of the sun, and from the four larger planets and certain fixed stars, as they would appear to an observer at the centre of the earth. They are given for every third hour of Greenwich mean time, beginning at noon; the dates are therefore astronomical. All the distances that can be observed on the same day, are grouped together under that date; and the columns are read from left to right, across both pages of the same opening. The letter W. or E. is affixed to the name of the sun, planet or star, to indicate that it is on the west, or east side of the moon.

An observer on the earth's surface having measured a lunar distance, corrected it for errors of his instrument and for the semidiameter of the objects, and cleared it from the effects of refraction and parallax, finds the true or geocentric distance, that is, the distance as it would have appeared from the centre of the earth at the moment of observation. With this distance and the distances in the Ephemeris of the same bodies on the same day, the Greenwich mean time of the observation can be found.

To lessen the labor of computation, there is given in the Ephemeris, between every two successive distances, the logarithm of the seconds of time in which the distance changes 1″; or, as it is usually called, the *Proportional Logarithm of the Difference.* It is given for the middle instant of the two hours between which it is placed.

For computing the Greenwich time we have the following rule:—

Find in the Almanac the two distances between which the true distance falls; take out the nearer of these, the hours of Greenwich time over it, and the P. L. of Diff. between them.

Find the difference between the true distance and the distance taken from the Almanac; and from the proportional logarithm of this difference, as found in the Navigator, subtract the P. L. of Diff. taken from the Almanac.

The result is the proportional logarithm of an interval of time to be added to the hours of Greenwich time, taken from the Almanac, when the earlier Almanac-distance is used; to be subtracted from the hours of Greenwich time, when the later Almanac-distance is used.

Another method is, to add the common logarithm of the difference of the true and the Almanac-distances to the P. L. of Diff. of the Almanac; the sum will be the common logarithm of the correction to be applied to the hours of Greenwich time. The Table of *Logarithms of small Arcs in Space or Time,* given at the end of the volume for 1871, saves the operation of reducing degrees (or hours) and minutes to seconds, and the reverse.

As the P. L. of Diff. in the Ephemeris varies, the Greenwich time found by the methods just described may not be sufficiently exact. To correct it for such variation, or second difference, take the difference between the P. L. of Diff. used and the one which follows it in the Ephemeris, (or, more strictly, half the difference of the preceding and following ones). With this difference, and the first correction of the Greenwich time already found, enter Table I, appended to this volume, and take out the corresponding seconds, which are to be added to the approximate Greenwich time when the Prop. Logs. in the Ephemeris are decreasing; and subtracted when they are increasing.

Thus the Greenwich mean time of the observation can be obtained. If the observer has noted the time of observation by a chronometer, the difference of this chronometer-time and the Greenwich mean time will be the error of the chronometer on Greenwich time as found from the lunar distance. In this way lunar distances can be used as a check upon the chronometer. By a series of carefully observed lunar distances on both sides of the moon, the chronometer-error may generally be ascertained within 20 or 30 seconds.

If the observer has found the local mean time of observation from the observed altitude of one of the bodies, or by a watch regulated to that time by recent observations and corrected for change of longitude in the interval, the difference of this local time and the Greenwich time found from the lunar distance will be his longitude. A longitude derived by this method should always be considered as uncertain by 5′ or more.

As an example of finding the Greenwich mean time from a lunar distance, suppose that in 1887, June 5, about 3^h of Greenwich mean time, the corrected distance of the moon's centre from that of *a* Aquilæ is 52° 12′:—

Corrected distance	52° 12′ 0″	
Distance in Ephemeris June 5, III^h . . .	53 0 29	P. L. 0.3209
Difference	0 48 29	P. L. 0.5697
		P. L. 0.2488
Time from III^h (*after*)	h m s +1 41 30	
Corr. for 2d Diff., Table I	− 17	
Greenwich mean time June 5	1 41 13	

By a table of common logarithms, or a table of logarithms of small arcs, the reduction of the Greenwich time would be found thus:—

From Ephemeris	P. L.	0.3209
Diff. of distances, $48' 29'' = 2909''$	log	3.4637
Red. of Greenwich time, $+ 1^h 41^m 30^s = 6090^s$	log	3.7846

The result is the same as by the previous method.

Pages 218—249 contain the geocentric ephemerides of the seven major planets. The positions are referred to the equator and true equinox of the date, and corrected for aberration; they are, therefore, apparent positions. All the data except meridian passage are given for the moment of Greenwich mean noon. The column *Meridian Passage* gives the hour, minute and tenth of that passage of the planet over the meridian of Greenwich which occurs next after the noon of the date.

The right ascension and declination of a planet are required whenever it has been observed for time, latitude or azimuth. The mode of reducing them to any instant of Greenwich mean time is the same as in the examples for the sun, previously given. The local mean time of passage across any other meridian can be found by dividing the daily differences by 24, and multiplying the quotient by the hours and fractions of the longitude of the place. The product is subtractive from the time of Greenwich passage when the place is east of Greenwich, and additive when west. The corrections can never exceed one-half the change for one day.

Pages 250—263 contain the heliocentric positions of the seven major planets, and the logarithms of their distances from the earth. The heliocentric longitude is reckoned, not from the true equinox, as in the preceding ephemerides, but from the mean equinox of the date. It is, therefore, necessary to apply nutation, if the longitude from the true equinox is required. The daily motion is given for the moment of Greenwich mean noon. The column *Reduction to Orbit* gives the correction to be applied to the heliocentric longitudes in order to obtain the longitude counted along the orbit of the planet. This longitude is equal to the distance of the node from the mean equinox, plus the distance of the planet from the node. The heliocentric latitude is counted from the moving plane of the ecliptic. The *Logarithm of Radius Vector* is the logarithm of the distance of the centre of the planet from that of the sun, at each Greenwich mean noon given in the first column. The two last columns give, in the same way, the logarithm of the true distance of the centre of the planet from that of the earth. The one column gives the quantity for the Greenwich noon indicated on the left hand side of the page, and the other for the noon which is midway between that date and the date next below it. In the case of Mercury, this intermediate date is mean noon of the day immediately following; in the case of Venus, Mars, Jupiter, and Saturn, it is mean noon of the second day following; and in the case of Uranus and Neptune, mean noon of the fourth day following.

Pages 264—271 contain the rectangular co-ordinates of the centre of the sun, referred to the centre of the earth as the origin, and to the true equator and equinox of each date as the circle and point of reference. Each co-ordinate is given first for Greenwich mean noon, and in the column following for mean midnight of the same day. The columns *Reduc. to Mean Eq'x of Jan.* 0 give the corrections to be applied to the co-ordinates for noon in order to obtain the corresponding co-ordinates referred to the mean equator and the mean equinox of January 0.

Pages 272—275 give the longitude and latitude of the moon for every Greenwich mean noon and midnight. Both quantities are referred to the true ecliptic and equinox of the date.

Pages 276 and 277 contain the position of the moon's equator and the mean longitude of the moon, and a table for computing the libration of the moon. The epochs of greatest libration of the moon, together with the formulæ for finding the libration in longitude and latitude are given on page 418.

Page 278 contains, for each tenth Greenwich mean noon, the values of the principal elements arising from the motion of the equinox, and also the aberration and parallax of the sun. The column *Apparent Obliquity of the Ecliptic* (HANSEN) gives the true inclination of the earth's equator to the ecliptic, without correction for the terms depending on the moon's longitude. The *Equation of Equinoxes* is really the astronomical nutation; that given *In Longitude* is the correction to be applied to the longitude of the body referred to the mean equinox, in order to obtain that longitude as referred to the true equinox. When the correction is positive, the true longitudes are greater than those referred to the mean equinox; while the contrary is true when the correction has the negative sign. The equation *In R. A.* is equal to that in longitude, multiplied by the cosine of the obliquity of the ecliptic.

The next column gives the *Precession of Equinoxes in Longitude*, from January 0 to each of the dates following. *The Sun's Aberration* is the quantity which is to be applied to the true longitude of the sun in order to obtain its apparent longitude. The correction being negative shows that the apparent longitude as affected by aberration is always less than the true longitude. The sun's equatorial horizontal parallax, given in the next column, is the angle subtended by the radius of the earth's equator, as seen from the centre of the sun.

PART II—THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Page 280 contains the formulæ for reducing the positions of the fixed stars, using the notation of BESSEL, and the constants of PETERS and STRUVE. The formulæ by which the star-numbers are computed are also given.

Pages 281—284 contain the logarithms of the *Besselian Star-Numbers*, *A*, *B*, *C*, *D*, for each Washington mean midnight. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at the dates for which the numbers are given. If used in accordance with the English and French notation, the pair of quantities *A* and *B* must be interchanged with the pair *C* and *D*; that is, *A* must be interchanged with *C*, and *B* with *D*. In the first column along with the solar day is given, for certain dates, the sidereal hour and tenth of midnight. The sidereal time for which any set of quantities is given can be found by interpolation from these numbers.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers: —

Computation of the apparent place of α Bootis for 1887, *July* 2, *for the upper transit at Washington.*

(Star-Catalogue)	log a	0.4492	log b	8.3049 n	log c	8.7757 n	log d	8.5819 n
(Page 283)	log A	9.4615	log B	0.8888	log C	0.5428	log D	1.3029 n
(Star-Catalogue)	log a'	1.2276 n	log b'	9.7317	log c'	9.7713	log d'	9.4546 n
	log Aa	9.9107	log Bb	9.1937 n	log Cc	9.3185 n	log Dd	9.8848
	log Aa'	0.6891 n	log Bb'	0.6205	log Cc'	0.3141	log Dd'	0.7575

		h m s		° ′ ″
Mean Place, 1887.0, (page 298)	$\alpha_0 =$	14 10 30.450	$\delta_0 =$	+ 19 46 15.76
	$Aa =$	+ 0.814	$Aa' =$	− 4.89
	$Bb =$	− 0.156	$Bb' =$	+ 4.17
	$Cc =$	− 0.208	$Cc' =$	+ 2.06
	$Dd =$	+ 0.767	$Dd' =$	+ 5.72
	$E =$	− 0.001	$\tau\mu' =$	− 1.00
	$\tau\mu =$	+ 0.040		
Apparent Place, 1887, *July* 2,	$\alpha =$	14 10 31.626	$\delta =$	+ 19 46 21.83

Pages 285—292 contain the *Independent Star-Numbers*, which can be used for the same purpose. The column τ gives the fraction of the year from the beginning of the fictitious year to each date. These quantities are connected with those of BESSEL by the relations given on page 280, where are also found the formulæ and precepts for the application of both systems of numbers. In order to use the Besselian numbers, it is necessary to have the values of the star-constants, a, b, c, d, a', b', c', d'. The independent star-numbers, are given in order that the apparent place of the star may be determined when it is not convenient to compute these numbers.

The following is an example of the reduction of a star to apparent place by the independent star-numbers: —

Computation of the apparent place of α Bootis for 1887, *July* 2, *for the upper transit at Washington.*

$\alpha_0 = 14^{h}\ 10^{m}.5$ $\qquad\qquad$ $\delta_0 = +19^{\circ}\ 46'.3$

$G = 53^{\circ}\ 8'$ $\qquad\qquad$ $G + \alpha_0 = 265^{\circ}\ 45'$

$H = 170\ \ 8.2$ $\qquad\qquad$ $H + \alpha_0 = 22\ 45.7$

$\log \frac{1}{15}$	8.8239	$\log \frac{1}{15}$	8.8239	$\alpha_0 =$	$14^{h}\ 10^{m}\ 30^{s}.450$
$\log g$	0.9857	$\log h$	1.3094	$f =$	$+\ 0.888$
$\log \sin (G+\alpha_0)$	9.9988 *n*	$\log \sin (H+\alpha_0)$	9.5874	$(g) =$	$-\ 0.231$
$\log \tan \delta_0$	9.5557	$\log \sec \delta_0$	0.0264	$(h) =$	$+\ 0.559$
$\log (g)$	9.3641 *n*	$\log (h)$	9.7471	$\tau \mu =$	$-\ 0.040$
			Apparent Right Ascension	$=$	14 10 31.626
$\log g$	0.9857	$\log h$	1.3094		
$\log \cos (G+\alpha_0)$	8.8690 *n*	$\log \cos (H+\alpha_0)$	9.9648	$\delta_0 =$	$+\ 19^{\circ}\ 46'\ 15''.76$
$\log (g')$	9.8547 *n*	$\log \sin \delta_0$	9.5293	$(g') =$	$-\ 0.72$
		$\log (h')$	0.8035	$(h') =$	$+\ 6.36$
$\log i$	0.1803			$(i) =$	$+\ 1.43$
$\log \cos \delta_0$	9.9736			$\tau \mu' =$	$-\ 1.00$
$\log (i)$	0.1539				
			Apparent Declination	$=$	$+\ 19\ 46\ 21.83$

Pages 293—301 contain the mean places of three hundred and eighty-three stars, for the beginning of the fictitious year 1887, or the moment when the sun's mean longitude is 280°.

The annual variations are to be considered as the differential coefficients of each co-ordinate with respect to the time at the beginning of the year.

In order that the list of mean places of stars may serve the purpose of a working-catalogue for the convenient use of astronomers, the position of each of the northern circumpolar stars is given in duplicate, one position being for the upper and the other for the lower culmination. The positions for the lower culmination are marked S. P. In this case, the right ascensions are the sidereal times at which the star crosses the lower meridian; and, in order to have the expressions for the co-ordinates congruous in all cases, the declinations are counted from the equator through the north pole, and therefore exceed 90°. The time of observation and setting of the circle, in order to find a star on the meridian, are then obtained uniformly for all the stars.

Beginning with the volume for 1882, the number of stars has been greatly increased, in order to make the list more useful to field-astronomers. In order to show at a glance these additional stars, they are indicated in the list by an asterisk. *

Pages 302—313 contain the apparent positions of the four north polar stars, α, δ, and λ Ursæ Minoris, and 51 Cephei, for every upper transit at Washington. They include the terms depending on the moon's longitude. The mean solar time of transit is given in the column *Mean Solar Date*, in order that each transit above and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26th is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 302, we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7 But, the lower transit following that of July 1st (page 308), does not take place until July 2.3. Hence, the lower transit of July 1st precedes the upper one of the same date. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column of *Mean Solar Date.*

Pages 314—364 contain, for every tenth upper transit at Washington, the apparent places of those stars of the preceding list which are not marked with an asterisk. The mean solar date in each left hand column gives the day and tenth of the transit; so that each intermediate transit may be readily identified. Along with each co-ordinate is given, in small type, the change for ten days. This quantity is to be regarded as the differential coefficient corresponding to the dates for which the star-places are given.

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* A supplement to the Ephemeris for 1884, containing the apparent right ascensions of these additional stars for the years 1881—1884, has been issued.

Pages 365—376 contain the apparent right ascensions of all stars marked with an asterisk in the list of mean places. The apparent right ascension of each star is given only for that part of the year when it may readily be observed on the meridian. In the case of circumpolar stars, the right ascensions for lower, as well as upper, transit are given.

Pages 377—384 contain the apparent right ascension, declination, and semidiamter of the sun, and the sidereal time, all for Washington mean noon. Adjoining columns give the seconds of right ascension and of declination for apparent noon, that is, for the moment of transit of the sun's centre over the meridian of Washington. The hours and minutes of right ascension, and the degrees and minutes of declination are the same for both mean and apparent noon. In case they would have differed, the minute which would have been numerically larger is diminished by one, and the seconds increased by sixty, so that there is always a correspondence between the two numbers. The hourly motions in right ascension and declination are given for the moment of mean noon, but may be regarded as having the same values for apparent noon.

The *Equation of Time for Apparent Noon* is the correction to be applied to apparent time in order to obtain mean time. It is, therefore, mean time minus apparent time. Each number as given is the mean time of transit of the sun's centre over the meridian of Washington, counted from the nearest noon. The use of all the quantities is substantially the same as in the *Ephemeris for the Meridian of Greenwich.*

Pages 385—392 contain the right ascension, declination, semidiameter, and parallax of the moon, at the moment of transit over the meridian of Washington. The mean time given in the second column is that of transit of the moon's centre over this meridian. The differences for one hour of longitude are the amounts by which the local mean times of transit over a meridian one hour west of Washington exceed those given in the column *Mean Time of Transit*, supposing the rate of change to be uniform and equal to what it is at the moment of transit over the meridian of Washington. The next four columns need no especial explanation, except that the differences for one hour of longitude are computed as if the motion of the moon in right ascension were uniform. By means of them, the position of the moon can be computed with astronomical accuracy at the moment of transit over any meridian not exceeding one hour in longitude from that of Washington, by taking account of second differences. With greater longitudes of the place, the accuracy of the result obtained in this way will diminish. The columns of sidereal time of semidiameter passing meridian, etc., do not seem to need any explanation, except that they all refer to the moment of transit. The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When two opposite limbs are both so nearly full that they can be well observed, both are indicated; and the one which is deficient is printed in smaller type. When the illumination is so nearly equal that no choice can be made between them, both are printed in large type.

Pages 393—409 contain the geocentric apparent right ascensions and declinations of the seven major planets, and their semidiameters and horizontal parallaxes, for the moments of all those transits over the meridian of Washington which can be observed.

PART III—PHENOMENA.

This portion of *The American Ephemeris and Nautical Almanac* gives the principal astronomical phenomena of the year, reduced to Washington mean time, except in the case of the eclipses and the data for the rings of Saturn, which are given in Greenwich mean time.

Pages 412—417 inclusive contain the elements necessary for computing the eclipses of the sun which occur during the year.

The eclipse-elements are given for the moment of conjunction of the sun and moon in right ascension. The subsequent tables and results are not, however, computed from these elements unchanged; but from the accurate positions of the two bodies as interpolated for each hour of the eclipse. The principal circumstances of each eclipse are as follow:—

On the line "Eclipse begins" is given the Greenwich mean time at which the earth first touches the moon's penumbra, and the longitude and latitude of the point of touching.

The "Central eclipse begins" when the axis of the moon's shadow first touches the earth, and the longitude and latitude of the point of touching follow.

"Central eclipse at noon" indicates the moment when the axis of the shadow is coincident with the plane of the meridian at the point of its intersection with the earth's surface. To the observer at this point, the eclipse will be central at the moment of apparent noon.

"Central eclipse ends" and "Eclipse ends" have the converse meaning of the beginning.

Maps of the Eclipses.—The regions in which each eclipse is visible are shown upon the maps given in connection with them. From these maps may also be derived the approximate determination of the times of beginning and ending, and of the magnitude of the eclipses at any place. The dotted curves show the outlines of the shadow for each hour of Greenwich mean time and therefore pass through all the places where the eclipse begins or ends at that hour. To find at what hour the eclipse begins at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between these two hours of Greenwich mean time: the fraction of the hour may be determined by dividing the hour proportionally to the space which it represents on the map. This division may be a little more exact by allowing for the changes in this space as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the time at which the eclipse of 1887, August 18, begins and ends at Yedo.

For the beginning we compare the distance of the place from the curve of 17^h with the distance between the curves of 16^h and 17^h and we find it to correspond to about 12 minutes, therefore the time of beginning is approximately 17^h 12^m. For the end we compare the distance of the place from the curve of 19^h with the distance between the curves of 18^h and 19^h and we find it to correspond to about 30 minutes, therefore the eclipse ends at about 19^h 30^m— which times are probably within 2 or 3 minutes of the truth. Changing to local time the results will be:—

		Beginning. h	m	Ending. h	m
Greenwich mean time	August 18,	17	12	19	30
Longitude East of Greenwich . .		+ 9	20	+ 9	20
Local mean time	19,	2	32 ± 2	4	50 ± 2

In the case of total and annular eclipses, a rough estimate of the magnitude of the eclipse may be obtained from the position of the place relatively to the central line and to the limit. On the central line, the eclipse is annular or total, while on the limit, the limb of the moon only grazes that of the sun.

More Accurate Computations.—A more accurate determination of the phases as visible at any point of the earth's surface may be obtained from the Besselian elements which are given for every ten minutes of Greenwich mean time. Their geometric signification is as follows:—

Let us imagine a plane passing through the centre of the earth, perpendicular to the right line joining the centres of the sun and moon. This latter line is the axis of the moon's shadow, and the plane is called the *fundamental plane*. We take the intersection of this plane with that of the earth's equator as the axis of X, and the centre of the earth as the origin of co-ordinates. The axis of Y is perpendicular to that of X, and directed toward the north; x and y are then the co-ordinates of the point in which the axis of the shadow intersects the fundamental plane. The angle d, of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; this direction being that from the earth toward the moon and sun. The angle μ is the Greenwich hour-angle of this same point of the celestial sphere.

The quantities l and l' are the radii of the shadow-cones upon the fundamental plane, l corresponding to the penumbra, and l' to the umbra, or annulus. The notation is that of CHAUVENET's *Spherical and Practical Astronomy*, in which l' is regarded as positive for an annular, and negative for a total eclipse.

The angles f and f', the tangents of which are given, are the angles which the elements of the respective shadow-cones make with the axis of the shadow; or, they are the semi-angles of the two cones.

At the bottom of the table are given the logarithms of the change of x, y and μ, in one minute, in order to facilitate the interpolation to any required moment.

The method of computing the eclipse from the given elements is as follows: It is premised that the moments of beginning and ending are those at which the distance of the observer from the axis of the shadow or penumbra is equal to the radius of the latter at the point of observation. To find such distance and radius we compute—

(1) The co-ordinates, ξ, η and ζ, of the observer, at some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase, together with their variations for one minute.

(2) The co-ordinates x and y of the axis of the shadow at the same moment, which, with their variations for one minute, are taken from the tables of elements.

(3) Hence, the position and motion of the observer relative to the axis of the shadow.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer.

(5) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to this radius.

The formulæ and directions for the several steps in the computation are as follow:—

(1) Find the geocentric co-ordinates of the station referred to the earth's equator, which are represented by $\rho \cos \varphi'$ and $\rho \sin \varphi'$, ρ being the distance from the centre of the earth, and φ' the geocentric latitude. These may be obtained from geodetic tables, or may be computed from the following table by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

φ being, as usual, the geographic latitude.

Table for Computing the Geocentric Co-ordinates of a Place.

φ	Log F.		Log G.	
0°	0.00000	1	0.00302	2
5	0.00001	4	0.00300	3
10	0.00005	5	0.00297	5
15	0.00010	8	0.00292	8
20	0.00018	9	0.00284	9
25	0.00027	11	0.00275	11
30	0.00038	12	0.00264	12
35	0.00050	12	0.00252	13
40	0.00062	13	0.00239	13
45	0.00075	13	0.00226	13
50	0.00088	13	0.00213	12
55	0.00101	12	0.00201	12
60	0.00113	11	0.00189	11
65	0.00124	9	0.00178	9
70	0.00133	8	0.00169	8
75	0.00141	5	0.00161	6
80	0.00146	4	0.00155	3
85	0.00150	1	0.00152	1
90	0.00151		0.00151	

For the assumed Greenwich mean time of computation, take from the table of elements the values of $\sin d$, $\cos d$, and μ. Put:

λ, the longitude west from Greenwich. The co-ordinates of the observer will then be:—

$$\xi = \rho \cos \varphi' \sin (\mu - \lambda)$$
$$\eta = \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda)$$
$$\zeta = \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda)$$

and their variations in one minute of mean time will be:—

$$\xi' = [7.63992]\, \rho \cos \varphi' \cos (\mu - \lambda)$$
$$\eta' = [7.63992]\, \rho \cos \varphi' \sin d \sin (\mu - \lambda) = [7.63992]\, \xi \sin a$$

ζ' is not wanted.

(2) The co-ordinates x and y of the axis of the shadow are taken from the tables of elements for the same assumed moment of Greenwich mean time, together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. The variations for one minute we represent by x' and y'. Their logarithms are given at the foot of the tables.

(3) The distance m and position-angle M of the axis of the shadow relative to the observer, and the relative motions, n and N, are computed by the formulæ:—

$$m \sin M = x - \xi$$
$$m \cos M = y - \eta$$
$$n \sin N = x' - \xi'$$
$$n \cos N = y' - \eta'$$

(4) The radius L of the shadow or penumbra at the distance ζ from the fundamental plane is computed by the formula

$$L = l - \zeta \tan f$$

l and f being found in the table of elements, and ζ computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or end of the eclipse, we shall have—

$$m = L$$

But, as this condition can scarcely ever be fulfilled on a first trial, a correction τ to the assumed time is computed thus: Find the angle ψ from the equation,

$$\sin \psi = \frac{m \sin (M - N)}{L}$$

There will be two values to this angle, of which one will be in the first and the other in the second quadrant when $\sin \psi$ is positive, and one in the third and the other in the fourth when $\sin \psi$ is negative. But, simplicity will be gained by taking only that value of ψ for which $\cos \psi$ is positive. This value lies between the limits + 90° and − 90°. The correction τ to the assumed time will be found in minutes, from—

For beginning: $$\tau = -\frac{m \cos (M - N)}{n} - \frac{L \cos \psi}{n}$$

For ending: $$\tau = -\frac{m \cos (M - N)}{n} + \frac{L \cos \psi}{n}$$

One such pair of values of τ cannot, however, give the times of both beginning and ending with accuracy. To attain accuracy we must, in commencing the computation, assume two times, one as near as practicable to that of beginning, and another near that of ending. These approximate times may be derived from the chart of the eclipse. We shall thus have two pairs of values of τ. The computation for the first assumed time will give a small and nearly correct value for the beginning of the eclipse, and a large value which, added to the assumed time, will give an inaccurate time of ending. The computation for the second assumed time will give a small and nearly correct value for the end, and a large negative and inaccurate one for the beginning. We shall thus deduce two times of beginning and two of ending, of each of which only one is to be considered approximately correct.

The more accurate times of beginning and ending may now be taken in place of the first assumed ones, and the computation may be repeated from the beginning, leading to a pair of values of τ, which should be very small and accurate. Such a repetition of the computation will in general be advisable, to guard against accidental numerical errors. The following theorem will, however, enable us to obtain a second approximation to the true times of each phase without repeating the computation.

THEOREM.—*The error of each result is approximately proportional to the square of the correction* τ, *multiplied by the sine of the sun's hour-angle*, $(\mu-\lambda)$, *for the middle of the interval between the time of computation and that of the phase.*

To apply this theorem we find the two values of $\tau^2 \sin(\mu-\lambda)$ corresponding to the required phase. We then find the ratio of these quantities—which will commonly be a large number, and divide the difference of the results by this ratio. The quotient will be a correction to be applied to the more accurate result in such a way as to make it deviate yet more from the less accurate one. This correction should be positive in the local forenoon, and negative in the afternoon, and its value should never materially exceed $0^{\text{m}}.001\,\tau^2$.

Unless the times chosen for computation are unusually in error, say ten minutes or more, the corrected results thus obtained will be theoretically correct within less than a second. But to guard against numerical errors it is better, after making this final correction, to repeat the computations so far as to obtain new values of m and L for the corrected times. If these two quantities agree within a unit of the fourth place of decimals, the times employed are generally correct within a second of time. If they differ too widely, farther corrections and recomputations may be made by the computer according to his own judgment.

It may be remarked that the uncertainty of the ephemerides is such that a prediction may be several seconds in error from this unavoidable cause alone.

Position-angle of Point of Contact.—The position-angle, P, of the point of contact, reckoned from the north point of the sun's limb toward the east, is found by the formula

For beginning: $P = N - \psi \pm 180°$
For end: $P = N + \psi$

it being assumed that, in each case, the value of ψ is taken between the limits $\pm$ 90°.

Computation of the Solar Eclipse of 1887, *August* 18, *for Sawa Umi Bay, in the Island of Sado, Japan.*

Latitude, $\varphi = +\ 37°\ 56'$
Longitude, $\lambda = -\ 138°\ 17'$

Constants for the given place:—

$$\rho \sin \varphi' = 9.78633$$
$$\rho \cos \varphi' = 9.89747$$

From the Eclipse Chart we find the approximate times of the phases as follows:—

	h	m	
Beginning . . .	17	12	Greenwich Mean Time.
Total phase . . .	18	24	
Ending . . .	19	30	

	Beginning.	Total phase.	Ending.
	h m	h m	h m
Greenwich Mean Time	17 12	18 24	19 30
μ	257° 6′ 48″	275° 7′ 0″	291° 37′ 18″
$\mu-\lambda$	35 23 48	53 24 0	69 54 18
$\rho \cos \varphi'$	9.89747	9.89747	9.89747
$\sin(\mu-\lambda)$	9.76285	9.90462	9.97272
$\log \xi$	9.66032	9.80209	9.87019
ξ	+ 0.45742	+ 0.63400	+ 0.74163

Page IV contains *The Moon's Semidiameter* and Equatorial *Horizontal Parallax*, for each mean noon and midnight at Greenwich. Columns adjoining those of the horizontal parallax give the change of this quantity in one hour, by means of which it can be reduced to any other Greenwich mean time, in the same way as the sun's declination and the equation of time in the preceding examples. The sign plus or minus prefixed to the hourly differences, shows whether the horizontal parallax is increasing or decreasing.

The reduction of the moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.272. It may also be obtained from Table XI of Bowditch's *Navigator*, or by simply computing the proportional part.

If, for example, the semidiameter of the moon is to be taken out for 1887, Jan. 21, 10^{h}, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of Jan. 21 is $3''.8$; then,

$$\text{as } 12^{h} : 10^{h} = 3''.8 : 3''.16,$$

which is the correction to be subtracted from the semidiameter at noon, because the semidiameter is decreasing. The moon's semidiameter then, for Jan. 21, 10^{h}, is $15'\ 18''.6 - 3''.16$, or $15'\ 15''.4$.

The moon's semidiameter and horizontal parallax are required for all observations of the moon. When great precision is needed, the hourly differences should be first interpolated for half the interval of Greenwich time from noon or midnight, and a correction applied to the horizontal parallax for the latitude of the place of observation.

The *Mean Time of the Moon's Upper Transit at Greenwich*, which is given on page IV to tenths of a minute, is also accompanied with a column of differences for one hour of longitude, by means of which, having the longitude converted into time, the local time of the moon's meridian passage at any other place, may be computed. The reduction may be taken by simple inspection from Bowditch's Table XXVIII. The last column of this page contains the *Age* of the moon, or the time elapsed since the preceding new moon, to tenths of a day.

Pages V—XII contain *The Moon's Right Ascension*, and *Declination*, for each day and hour of Greenwich mean time. They are accompanied with columns of differences for one minute, which are also given at each hour. The Greenwich mean time, which is required for taking out these quantities, may be taken from a well-regulated chronometer, or obtained by applying the longitude converted into time, to the local mean time of the observer. The right ascension or declination is taken out for the day and hour of the Greenwich mean time; the *Diff. for* 1 *Minute* multiplied by the minutes and parts of a minute of the Greenwich time, and the product added to, or subtracted from the quantity, according as the quantity is increasing or decreasing.

Thus, suppose the moon's right ascension and declination are required for 1887, Sept. 9, $10^{h}\ 10^{m}\ 30^{s}$, astronomical mean time at Greenwich:—

		Right Ascension.			*Declination.*
		h m s			° ′ ″
Sept. 9, 10^{h}		4 31 11.52	. . . . . .		N. 16 55 6.2
Diff. $2^{s}.1055 \times 10.5$ . .	=	+ 22.11	$5''.588 \times 10.5$	=	+ 58.7
Sept. 9, $10^{h}\ 10^{m}\ 30^{s}$ . . .		4 31 33.63	. . . . . .		N. 16 56 4.9

The differences interpolated for $5^{m}.2 = 0^{h}.09$ are, for the right ascension $2^{s}.0062$, and for the declination $5''.575$, which may be used for greater precision.

Page XII contains also the *Phases of the Moon* and the dates of the *Moon's Perigee and Apogee*, or least and greatest distances from the earth.

Pages XIII—XVIII contain the *Lunar Distances*, or the angular distances of the centre of the moon from the centre of the sun, and from the four larger planets and certain fixed stars, as they would appear to an observer at the centre of the earth. They are given for every third hour of Greenwich mean time, beginning at noon; the dates are therefore astronomical. All the distances that can be observed on the same day, are grouped together under that date; and the columns are read from left to right, across both pages of the same opening. The letter W. or E. is affixed to the name of the sun, planet or star, to indicate that it is on the west, or east side of the moon.

An observer on the earth's surface having measured a lunar distance, corrected it for errors of his instrument and for the semidiameter of the objects, and cleared it from the effects of refraction and parallax, finds the true or geocentric distance, that is, the distance as it would have appeared from the centre of the earth at the moment of observation. With this distance and the distances in the Ephemeris of the same bodies on the same day, the Greenwich mean time of the observation can be found.

To lessen the labor of computation, there is given in the Ephemeris, between every two successive distances, the logarithm of the seconds of time in which the distance changes 1″; or, as it is usually called, the *Proportional Logarithm of the Difference.* It is given for the middle instant of the two hours between which it is placed.

For computing the Greenwich time we have the following rule:—

Find in the Almanac the two distances between which the true distance falls; take out the nearer of these, the hours of Greenwich time over it, and the P. L. of Diff. between them.

Find the difference between the true distance and the distance taken from the Almanac; and from the proportional logarithm of this difference, as found in the Navigator, subtract the P. L. of Diff. taken from the Almanac.

The result is the proportional logarithm of an interval of time to be added to the hours of Greenwich time, taken from the Almanac, when the earlier Almanac-distance is used; to be subtracted from the hours of Greenwich time, when the later Almanac-distance is used.

Another method is, to add the common logarithm of the difference of the true and the Almanac-distances to the P. L. of Diff. of the Almanac; the sum will be the common logarithm of the correction to be applied to the hours of Greenwich time. The Table of *Logarithms of small Arcs in Space or Time,* given at the end of the volume for 1871, saves the operation of reducing degrees (or hours) and minutes to seconds, and the reverse.

As the P. L. of Diff. in the Ephemeris varies, the Greenwich time found by the methods just described may not be sufficiently exact. To correct it for such variation, or second difference, take the difference between the P. L. of Diff. used and the one which follows it in the Ephemeris, (or, more strictly, half the difference of the preceding and following ones). With this difference, and the first correction of the Greenwich time already found, enter Table I, appended to this volume, and take out the corresponding seconds, which are to be added to the approximate Greenwich time when the Prop. Logs. in the Ephemeris are decreasing; and subtracted when they are increasing.

Thus the Greenwich mean time of the observation can be obtained. If the observer has noted the time of observation by a chronometer, the difference of this chronometer-time and the Greenwich mean time will be the error of the chronometer on Greenwich time as found from the lunar distance. In this way lunar distances can be used as a check upon the chronometer. By a series of carefully observed lunar distances on both sides of the moon, the chronometer-error may generally be ascertained within 20 or 30 seconds.

If the observer has found the local mean time of observation from the observed altitude of one of the bodies, or by a watch regulated to that time by recent observations and corrected for change of longitude in the interval, the difference of this local time and the Greenwich time found from the lunar distance will be his longitude. A longitude derived by this method should always be considered as uncertain by 5′ or more.

As an example of finding the Greenwich mean time from a lunar distance, suppose that in 1887, June 5, about 3^{h} of Greenwich mean time, the corrected distance of the moon's centre from that of *α* Aquilæ is 52° 12′:—

Corrected distance	52° 12′ 0″		
Distance in Ephemeris June 5, III^{h} . . .	53 0 29	P. L.	0.3209
Difference	0 48 29	P. L.	0.5697
	h m s	P. L.	0.2488
Time from III^{h} (*after*)	+1 41 30		
Corr. for 2d Diff., Table I	− 17		
Greenwich mean time June 5	1 41 13		

By a table of common logarithms, or a table of logarithms of small arcs, the reduction of the Greenwich time would be found thus:—

From Ephemeris	P. L.	0.3209
Diff. of distances, $48' 29'' = 2909''$	log	3.4637
Red. of Greenwich time, $+ 1^h 41^m 30^s = 6090^s$	log	3.7846

The result is the same as by the previous method.

Pages 218—249 contain the geocentric ephemerides of the seven major planets. The positions are referred to the equator and true equinox of the date, and corrected for aberration; they are, therefore, apparent positions. All the data except meridian passage are given for the moment of Greenwich mean noon. The column *Meridian Passage* gives the hour, minute and tenth of that passage of the planet over the meridian of Greenwich which occurs next after the noon of the date.

The right ascension and declination of a planet are required whenever it has been observed for time, latitude or azimuth. The mode of reducing them to any instant of Greenwich mean time is the same as in the examples for the sun, previously given. The local mean time of passage across any other meridian can be found by dividing the daily differences by 24, and multiplying the quotient by the hours and fractions of the longitude of the place. The product is subtractive from the time of Greenwich passage when the place is east of Greenwich, and additive when west. The corrections can never exceed one-half the change for one day.

Pages 250—263 contain the heliocentric positions of the seven major planets, and the logarithms of their distances from the earth. The heliocentric longitude is reckoned, not from the true equinox, as in the preceding ephemerides, but from the mean equinox of the date. It is, therefore, necessary to apply nutation, if the longitude from the true equinox is required. The daily motion is given for the moment of Greenwich mean noon. The column *Reduction to Orbit* gives the correction to be applied to the heliocentric longitudes in order to obtain the longitude counted along the orbit of the planet. This longitude is equal to the distance of the node from the mean equinox, plus the distance of the planet from the node. The heliocentric latitude is counted from the moving plane of the ecliptic. The *Logarithm of Radius Vector* is the logarithm of the distance of the centre of the planet from that of the sun, at each Greenwich mean noon given in the first column. The two last columns give, in the same way, the logarithm of the true distance of the centre of the planet from that of the earth. The one column gives the quantity for the Greenwich noon indicated on the left hand side of the page, and the other for the noon which is midway between that date and the date next below it. In the case of Mercury, this intermediate date is mean noon of the day immediately following; in the case of Venus, Mars, Jupiter, and Saturn, it is mean noon of the second day following; and in the case of Uranus and Neptune, mean noon of the fourth day following.

Pages 264—271 contain the rectangular co-ordinates of the centre of the sun, referred to the centre of the earth as the origin, and to the true equator and equinox of each date as the circle and point of reference. Each co-ordinate is given first for Greenwich mean noon, and in the column following for mean midnight of the same day. The columns *Reduc. to Mean Eq'x of Jan.* 0 give the corrections to be applied to the co-ordinates for noon in order to obtain the corresponding co-ordinates referred to the mean equator and the mean equinox of January 0.

Pages 272—275 give the longitude and latitude of the moon for every Greenwich mean noon and midnight. Both quantities are referred to the true ecliptic and equinox of the date.

Pages 276 and 277 contain the position of the moon's equator and the mean longitude of the moon, and a table for computing the libration of the moon. The epochs of greatest libration of the moon, together with the formulæ for finding the libration in longitude and latitude are given on page 418.

Page 278 contains, for each tenth Greenwich mean noon, the values of the principal elements arising from the motion of the equinox, and also the aberration and parallax of the sun. The column *Apparent Obliquity of the Ecliptic* (HANSEN) gives the true inclination of the earth's equator to the ecliptic, without correction for the terms depending on the moon's longitude. The *Equation of Equinoxes* is really the astronomical nutation; that given *In Longitude* is the correction to be applied to the longitude of the body referred to the mean equinox, in order to obtain that longitude as referred to the true equinox. When the correction is positive, the true longitudes are greater than those referred to the mean equinox; while the contrary is true when the correction has the negative sign. The equation *In R. A.* is equal to that in longitude, multiplied by the cosine of the obliquity of the ecliptic.

The next column gives the *Precession of Equinoxes in Longitude*, from January 0 to each of the dates following. *The Sun's Aberration* is the quantity which is to be applied to the true longitude of the sun in order to obtain its apparent longitude. The correction being negative shows that the apparent longitude as affected by aberration is always less than the true longitude. The sun's equatorial horizontal parallax, given in the next column, is the angle subtended by the radius of the earth's equator, as seen from the centre of the sun.

PART II—THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Page 280 contains the formulæ for reducing the positions of the fixed stars, using the notation of Bessel, and the constants of Peters and Struve. The formulæ by which the star-numbers are computed are also given.

Pages 281—284 contain the logarithms of the *Besselian Star-Numbers*, *A*, *B*, *C*, *D*, for each Washington mean midnight. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at the dates for which the numbers are given. If used in accordance with the English and French notation, the pair of quantities *A* and *B* must be interchanged with the pair *C* and *D*; that is, *A* must be interchanged with *C*, and *B* with *D*. In the first column along with the solar day is given, for certain dates, the sidereal hour and tenth of midnight. The sidereal time for which any set of quantities is given can be found by interpolation from these numbers.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers: —

Computation of the apparent place of α *Bootis for* 1887, *July* 2, *for the upper transit at Washington.*

(Star-Catalogue)	$\log a$	0.4492	$\log b$	8.3049 *n*	$\log c$	8.7757 *n*	$\log d$	8.5819 *n*
(Page 283)	$\log A$	9.4615	$\log B$	0.8888	$\log C$	0.5428	$\log D$	1.3029 *n*
(Star-Catalogue)	$\log a'$	1.2276 *n*	$\log b'$	9.7317	$\log c'$	9.7713	$\log d'$	9.4546 *n*
	$\log Aa$	9.9107	$\log Bb$	9.1937 *n*	$\log Cc$	9.3185 *n*	$\log Dd$	9.8848
	$\log Aa'$	0.6891 *n*	$\log Bb'$	0.6205	$\log Cc'$	0.3141	$\log Dd'$	0.7575

		h m s		° ′ ″
Mean Place, 1887.0, (page 298)	$\alpha_0 =$	14 10 30.450	$\delta_0 =$	+ 19 46 15.76
	$Aa =$	+ 0.814	$Aa' =$	− 4.89
	$Bb =$	− 0.156	$Bb' =$	+ 4.17
	$Cc =$	− 0.208	$Cc' =$	+ 2.06
	$Dd =$	+ 0.767	$Dd' =$	+ 5.72
	$E =$	− 0.001	$\tau\mu' =$	− 1.00
	$\tau\mu =$	+ 0.040		
Apparent Place, 1887, *July* 2,	$\alpha =$	14 10 31.626	$\delta =$	+ 19 46 21.83

Pages 285—292 contain the *Independent Star-Numbers*, which can be used for the same purpose. The column τ gives the fraction of the year from the beginning of the fictitious year to each date. These quantities are connected with those of Bessel by the relations given on page 280, where are also found the formulæ and precepts for the application of both systems of numbers. In order to use the Besselian numbers, it is necessary to have the values of the star-constants, *a*, *b*, *c*, *d*, *a′*, *b′*, *c′*, *d′*. The independent star-numbers, are given in order that the apparent place of the star may be determined when it is not convenient to compute these numbers.

The following is an example of the reduction of a star to apparent place by the independent star-numbers: —

Computation of the apparent place of α *Bootis for* 1887, *July* 2, *for the upper transit at Washington.*

$\alpha_0 = 14^{h}\ 10^{m}.5$ $\qquad \delta_0 = +19^{\circ}\ 46'.3$

$G = 53^{\circ}\ 8'$ $\qquad G + \alpha_0 = 265^{\circ}\ 45'$

$H = 170\ \ 8.2$ $\qquad H + \alpha_0 = 22\ \ 45.7$

$\log \frac{1}{15}$	8.8239	$\log \frac{1}{15}$	8.8239	$\alpha_0 =$	$14^{h}\ 10^{m}\ 30^{s}.450$
$\log g$	0.9857	$\log h$	1.3094	$f =$	$+\ 0.888$
$\log \sin (G+\alpha_0)$	$9.9988\,n$	$\log \sin (H+\alpha_0)$	9.5874	$(g) =$	$-\ 0.231$
$\log \tan \delta_0$	9.5557	$\log \sec \delta_0$	0.0264	$(h) =$	$+\ 0.559$
$\log (g)$	$9.3641\,n$	$\log (h)$	9.7471	$\tau\mu =$	$-\ 0.040$
				Apparent Right Ascension =	14 10 31.626
$\log g$	0.9857	$\log h$	1.3094		
$\log \cos (G+\alpha_0)$	$8.8690\,n$	$\log \cos (H+\alpha_0)$	9.9648	$\delta_0 =$	$+\ 19^{\circ}\ 46'\ 15''.76$
$\log (g')$	$9.8547\,n$	$\log \sin \delta_0$	9.5293	$(g') =$	$-\ 0.72$
		$\log (h')$	0.8035	$(h') =$	$+\ 6.36$
$\log i$	0.1803			$(i) =$	$+\ 1.43$
$\log \cos \delta_0$	9.9736			$\tau\mu' =$	$-\ 1.00$
$\log (i)$	0.1539				
				Apparent Declination =	+ 19 46 21.83

Pages 293—301 contain the mean places of three hundred and eighty-three stars, for the beginning of the fictitious year 1887, or the moment when the sun's mean longitude is 280°.

The annual variations are to be considered as the differential coefficients of each co-ordinate with respect to the time at the beginning of the year.

In order that the list of mean places of stars may serve the purpose of a working-catalogue for the convenient use of astronomers, the position of each of the northern circumpolar stars is given in duplicate, one position being for the upper and the other for the lower culmination. The positions for the lower culmination are marked S. P. In this case, the right ascensions are the sidereal times at which the star crosses the lower meridian; and, in order to have the expressions for the co-ordinates congruous in all cases, the declinations are counted from the equator through the north pole, and therefore exceed 90°. The time of observation and setting of the circle, in order to find a star on the meridian, are then obtained uniformly for all the stars.

Beginning with the volume for 1882, the number of stars has been greatly increased, in order to make the list more useful to field-astronomers. In order to show at a glance these additional stars, they are indicated in the list by an asterisk. *

Pages 302—313 contain the apparent positions of the four north polar stars, α, δ, and λ Ursæ Minoris, and 51 Cephei, for every upper transit at Washington. They include the terms depending on the moon's longitude. The mean solar time of transit is given in the column *Mean Solar Date*, in order that each transit above and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26th is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 302, we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7 But, the lower transit following that of July 1st (page 308), does not take place until July 2.3. Hence, the lower transit of July 1st precedes the upper one of the same date. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column of *Mean Solar Date.*

Pages 314—364 contain, for every tenth upper transit at Washington, the apparent places of those stars of the preceding list which are not marked with an asterisk. The mean solar date in each left hand column gives the day and tenth of the transit; so that each intermediate transit may be readily identified. Along with each co-ordinate is given, in small type, the change for ten days. This quantity is to be regarded as the differential coefficient corresponding to the dates for which the star-places are given.

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* A supplement to the Ephemeris for 1884, containing the apparent right ascensions of these additional stars for the years 1881—1884, has been issued.

Pages 365—376 contain the apparent right ascensions of all stars marked with an asterisk in the list of mean places. The apparent right ascension of each star is given only for that part of the year when it may readily be observed on the meridian. In the case of circumpolar stars, the right ascensions for lower, as well as upper, transit are given.

Pages 377—384 contain the apparent right ascension, declination, and semidiamter of the sun, and the sidereal time, all for Washington mean noon. Adjoining columns give the seconds of right ascension and of declination for apparent noon, that is, for the moment of transit of the sun's centre over the meridian of Washington. The hours and minutes of right ascension, and the degrees and minutes of declination are the same for both mean and apparent noon. In case they would have differed, the minute which would have been numerically larger is diminished by one, and the seconds increased by sixty, so that there is always a correspondence between the two numbers. The hourly motions in right ascension and declination are given for the moment of mean noon, but may be regarded as having the same values for apparent noon.

The *Equation of Time for Apparent Noon* is the correction to be applied to apparent time in order to obtain mean time. It is, therefore, mean time minus apparent time. Each number as given is the mean time of transit of the sun's centre over the meridian of Washington, counted from the nearest noon. The use of all the quantities is substantially the same as in the *Ephemeris for the Meridian of Greenwich.*

Pages 385—392 contain the right ascension, declination, semidiameter, and parallax of the moon, at the moment of transit over the meridian of Washington. The mean time given in the second column is that of transit of the moon's centre over this meridian. The differences for one hour of longitude are the amounts by which the local mean times of transit over a meridian one hour west of Washington exceed those given in the column *Mean Time of Transit*, supposing the rate of change to be uniform and equal to what it is at the moment of transit over the meridian of Washington. The next four columns need no especial explanation, except that the differences for one hour of longitude are computed as if the motion of the moon in right ascension were uniform. By means of them, the position of the moon can be computed with astronomical accuracy at the moment of transit over any meridian not exceeding one hour in longitude from that of Washington, by taking account of second differences. With greater longitudes of the place, the accuracy of the result obtained in this way will diminish. The columns of sidereal time of semidiameter passing meridian, etc., do not seem to need any explanation, except that they all refer to the moment of transit. The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When two opposite limbs are both so nearly full that they can be well observed, both are indicated; and the one which is deficient is printed in smaller type. When the illumination is so nearly equal that no choice can be made between them, both are printed in large type.

Pages 393—409 contain the geocentric apparent right ascensions and declinations of the seven major planets, and their semidiameters and horizontal parallaxes, for the moments of all those transits over the meridian of Washington which can be observed.

PART III—PHENOMENA.

This portion of *The American Ephemeris and Nautical Almanac* gives the principal astronomical phenomena of the year, reduced to Washington mean time, except in the case of the eclipses and the data for the rings of Saturn, which are given in Greenwich mean time.

Pages 412—417 inclusive contain the elements necessary for computing the eclipses of the sun which occur during the year.

The eclipse-elements are given for the moment of conjunction of the sun and moon in right ascension. The subsequent tables and results are not, however, computed from these elements unchanged; but from the accurate positions of the two bodies as interpolated for each hour of the eclipse. The principal circumstances of each eclipse are as follow:—

On the line "Eclipse begins" is given the Greenwich mean time at which the earth first touches the moon's penumbra, and the longitude and latitude of the point of touching.

The "Central eclipse begins" when the axis of the moon's shadow first touches the earth, and the longitude and latitude of the point of touching follow.

"Central eclipse at noon" indicates the moment when the axis of the shadow is coincident with the plane of the meridian at the point of its intersection with the earth's surface. To the observer at this point, the eclipse will be central at the moment of apparent noon.

"Central eclipse ends" and "Eclipse ends" have the converse meaning of the beginning.

Maps of the Eclipses.—The regions in which each eclipse is visible are shown upon the maps given in connection with them. From these maps may also be derived the approximate determination of the times of beginning and ending, and of the magnitude of the eclipses at any place. The dotted curves show the outlines of the shadow for each hour of Greenwich mean time and therefore pass through all the places where the eclipse begins or ends at that hour. To find at what hour the eclipse begins at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between these two hours of Greenwich mean time: the fraction of the hour may be determined by dividing the hour proportionally to the space which it represents on the map. This division may be a little more exact by allowing for the changes in this space as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the time at which the eclipse of 1887, August 18, begins and ends at Yedo.

For the beginning we compare the distance of the place from the curve of 17^h with the distance between the curves of 16^h and 17^h and we find it to correspond to about 12 minutes, therefore the time of beginning is approximately 17^h 12^m. For the end we compare the distance of the place from the curve of 19^h with the distance between the curves of 18^h and 19^h and we find it to correspond to about 30 minutes, therefore the eclipse ends at about 19^h 30^m—which times are probably within 2 or 3 minutes of the truth. Changing to local time the results will be:—

		Beginning. h m	Ending. h m
Greenwich mean time	**August 18,**	**17 12**	**19 30**
Longitude East of Greenwich . .		**+ 9 20**	**+ 9 20**
Local mean time	**19,**	**2 32 ± 2**	**4 50 ± 2**

In the case of total and annular eclipses, a rough estimate of the magnitude of the eclipse may be obtained from the position of the place relatively to the central line and to the limit. On the central line, the eclipse is annular or total, while on the limit, the limb of the moon only grazes that of the sun.

More Accurate Computations.—A more accurate determination of the phases as visible at any point of the earth's surface may be obtained from the Besselian elements which are given for every ten minutes of Greenwich mean time. Their geometric signification is as follows:—

Let us imagine a plane passing through the centre of the earth, perpendicular to the right line joining the centres of the sun and moon. This latter line is the axis of the moon's shadow, and the plane is called the *fundamental plane*. We take the intersection of this plane with that of the earth's equator as the axis of X, and the centre of the earth as the origin of co-ordinates. The axis of Y is perpendicular to that of X, and directed toward the north; x and y are then the co-ordinates of the point in which the axis of the shadow intersects the fundamental plane. The angle d, of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; this direction being that from the earth toward the moon and sun. The angle μ is the Greenwich hour-angle of this same point of the celestial sphere.

The quantities l and l' are the radii of the shadow-cones upon the fundamental plane, l corresponding to the penumbra, and l' to the umbra, or annulus. The notation is that of CHAUVENET's *Spherical and Practical Astronomy*, in which l' is regarded as positive for an annular, and negative for a total eclipse.

The angles f and f', the tangents of which are given, are the angles which the elements of the respective shadow-cones make with the axis of the shadow; or, they are the semi-angles of the two cones.

At the bottom of the table are given the logarithms of the change of x, y and μ, in one minute, in order to facilitate the interpolation to any required moment.

The method of computing the eclipse from the given elements is as follows: It is premised that the moments of beginning and ending are those at which the distance of the observer from the axis of the shadow or penumbra is equal to the radius of the latter at the point of observation. To find such distance and radius we compute—

(1) The co-ordinates, ξ, η and ζ, of the observer, at some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase, together with their variations for one minute.

(2) The co-ordinates x and y of the axis of the shadow at the same moment, which, with their variations for one minute, are taken from the tables of elements.

(3) Hence, the position and motion of the observer relative to the axis of the shadow.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer.

(5) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to this radius.

The formulæ and directions for the several steps in the computation are as follow:—

(1) Find the geocentric co-ordinates of the station referred to the earth's equator, which are represented by $\rho \cos \varphi'$ and $\rho \sin \varphi'$, ρ being the distance from the centre of the earth, and φ' the geocentric latitude. These may be obtained from geodetic tables, or may be computed from the following table by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

φ being, as usual, the geographic latitude.

Table for Computing the Geocentric Co-ordinates of a Place.

φ	Log F.		Log G.	
0°	0.00000	1	0.00302	2
5	0.00001	4	0.00300	3
10	0.00005	5	0.00297	5
15	0.00010	8	0.00292	8
20	0.00018	9	0.00284	9
25	0.00027	11	0.00275	11
30	0.00038	12	0.00264	12
35	0.00050	12	0.00252	13
40	0.00062	13	0.00239	13
45	0.00075	13	0.00226	13
50	0.00088	13	0.00213	12
55	0.00101	12	0.00201	12
60	0.00113	11	0.00189	11
65	0.00124	9	0.00178	9
70	0.00133	8	0.00169	8
75	0.00141	5	0.00161	6
80	0.00146	4	0.00155	3
85	0.00150	1	0.00152	1
90	0.00151		0.00151	

For the assumed Greenwich mean time of computation, take from the table of elements the values of sin d, cos d, and μ. Put:

λ, the longitude west from Greenwich. The co-ordinates of the observer will then be:—

$$\xi = \rho \cos \varphi' \sin (\mu - \lambda)$$
$$\eta = \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda)$$
$$\zeta = \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda)$$

and their variations in one minute of mean time will be:—

$$\xi' = [7.63992]\, \rho \cos \varphi' \cos (\mu - \lambda)$$
$$\eta' = [7.63992]\, \rho \cos \varphi' \sin d \sin (\mu - \lambda) = [7.63992]\, \xi \sin a$$

ζ' is not wanted.

(2) The co-ordinates x and y of the axis of the shadow are taken from the tables of elements for the same assumed moment of Greenwich mean time, together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. The variations for one minute we represent by x' and y'. Their logarithms are given at the foot of the tables.

(3) The distance m and position-angle M of the axis of the shadow relative to the observer, and the relative motions, n and N, are computed by the formulæ:—

$$m \sin M = x - \xi$$
$$m \cos M = y - \eta$$
$$n \sin N = x' - \xi'$$
$$n \cos N = y' - \eta'$$

(4) The radius L of the shadow or penumbra at the distance ζ from the fundamental plane is computed by the formula

$$L = l - \zeta \tan f$$

l and f being found in the table of elements, and ζ computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or end of the eclipse, we shall have—

$$m = L$$

But, as this condition can scarcely ever be fulfilled on a first trial, a correction τ to the assumed time is computed thus: Find the angle ψ from the equation,

$$\sin \psi = \frac{m \sin (M - N)}{L}$$

There will be two values to this angle, of which one will be in the first and the other in the second quadrant when sin ψ is positive, and one in the third and the other in the fourth when sin ψ is negative. But, simplicity will be gained by taking only that value of ψ for which cos ψ is positive. This value lies between the limits + 90° and − 90°. The correction τ to the assumed time will be found in minutes, from—

For beginning: $$\tau = -\frac{m \cos (M - N)}{n} - \frac{L \cos \psi}{n}$$

For ending: $$\tau = -\frac{m \cos (M - N)}{n} + \frac{L \cos \psi}{n}$$

One such pair of values of τ cannot, however, give the times of both beginning and ending with accuracy. To attain accuracy we must, in commencing the computation, assume two times, one as near as practicable to that of beginning, and another near that of ending. These approximate times may be derived from the chart of the eclipse. We shall thus have two pairs of values of τ. The computation for the first assumed time will give a small and nearly correct value for the beginning of the eclipse, and a large value which, added to the assumed time, will give an inaccurate time of ending. The computation for the second assumed time will give a small and nearly correct value for the end, and a large negative and inaccurate one for the beginning. We shall thus deduce two times of beginning and two of ending, of each of which only one is to be considered approximately correct.

The more accurate times of beginning and ending may now be taken in place of the first assumed ones, and the computation may be repeated from the beginning, leading to a pair of values of τ, which should be very small and accurate. Such a repetition of the computation will in general be advisable, to guard against accidental numerical errors. The following theorem will, however, enable us to obtain a second approximation to the true times of each phase without repeating the computation.

THEOREM.—*The error of each result is approximately proportional to the square of the correction* τ, *multiplied by the sine of the sun's hour-angle*, $(\mu-\lambda)$, *for the middle of the interval between the time of computation and that of the phase.*

To apply this theorem we find the two values of $\tau^2 \sin(\mu-\lambda)$ corresponding to the required phase. We then find the ratio of these quantities—which will commonly be a large number, and divide the difference of the results by this ratio. The quotient will be a correction to be applied to the more accurate result in such a way as to make it deviate yet more from the less accurate one. This correction should be positive in the local forenoon, and negative in the afternoon, and its value should never materially exceed $0^m.001\,\tau^2$.

Unless the times chosen for computation are unusually in error, say ten minutes or more, the corrected results thus obtained will be theoretically correct within less than a second. But to guard against numerical errors it is better, after making this final correction, to repeat the computations so far as to obtain new values of m and L for the corrected times. If these two quantities agree within a unit of the fourth place of decimals, the times employed are generally correct within a second of time. If they differ too widely, farther corrections and recomputations may be made by the computer according to his own judgment.

It may be remarked that the uncertainty of the ephemerides is such that a prediction may be several seconds in error from this unavoidable cause alone.

Position-angle of Point of Contact.—The position-angle, P, of the point of contact, reckoned from the north point of the sun's limb toward the east, is found by the formula

For beginning: $P = N - \psi \pm 180°$
For end: $P = N + \psi$

it being assumed that, in each case, the value of ψ is taken between the limits ± 90°.

Computation of the Solar Eclipse of 1887, *August* 18, *for Sawa Umi Bay, in the Island of Sado, Japan.*

Latitude, $\varphi = +\ 37°\ 56'$
Longitude, $\lambda = -\ 138°\ 17'$

Constants for the given place:—

$$\rho \sin \varphi' = 9.78633$$
$$\rho \cos \varphi' = 9.89747$$

From the Eclipse Chart we find the approximate times of the phases as follows:—

	h	m	
Beginning . . .	17	12	Greenwich Mean Time.
Total phase . . .	18	24	
Ending . . .	19	30	

	Beginning.	Total phase.	Ending.
	h m	h m	h m
Greenwich Mean Time	17 12	18 24	19 30
μ	257° 6′ 48″	275° 7′ 0″	291° 37′ 18″
$\mu-\lambda$	35 23 48	53 24 0	69 54 18
$\rho \cos \varphi'$	9.89747	9.89747	9.89747
$\sin(\mu-\lambda)$	9.76285	9.90462	9.97272
$\log \xi$	9.66032	9.80209	9.87019
ξ	+ 0.45742	+ 0.63400	+ 0.74163

	Beginning. h m	Total phase. h m	Ending. h m
Greenwich Mean Time	17 12	18 24	19 30
$\rho \sin \varphi'$	9.78633	9.78633	9.78633
$\cos d$	9.98889	9.98892	9.98895
$\log \rho \sin \varphi' \cos d$	9.77522	9.77525	9.77528
(1)	+ 0.59596	+ 0.59600	+ 0.59604
$\rho \cos \varphi'$	9.89747	9.89747	9.89747
$\sin d$	9.34882	9.34830	9.34781
$\cos (\mu - \lambda)$	9.91125	9.77541	9.53603
$\log \rho \cos \varphi' \sin d \cos (\mu - \lambda)$	9.15754	9.02118	8.78131
(2)	+ 0.14373	+ 0.10500	+ 0.06044
(1)−(2) η	+ 0.45223	+ 0.49100	+ 0.53560
$\rho \sin \varphi'$	9.78633	9.78633	9.78633
$\sin d$	9.34882	9.34830	9.34781
$\log \rho \sin \varphi' \sin d$	9.13515	9.13463	9.13414
(1)	+ 0.13651	+ 0.13634	+ 0.13619
$\rho \cos \varphi'$	9.89747	9.89747	9.89747
$\cos d$	9.98889	9.98892	9.98895
$\cos (\mu - \lambda)$	9.91125	9.77541	9.53603
$\log \rho \cos \varphi' \cos d \cos (\mu - \lambda)$	9.79761	9.66180	9.42245
(2)	+ 0.62750	+ 0.45900	+ 0.26451
(1)+(2) ζ	+ 0.76401	+ 0.59534	+ 0.40070
constant log	7.63992	7.63992	7.63992
$\rho \cos \varphi' \cos (\mu - \lambda)$	9.80872	9.67288	9.43350
$\log \xi'$	7.44864	7.31280	7.07342
ξ'	+ 0.00281	+ 0.002055	+ 0.001184
constant log	7.63992	7.63992	7.63992
$\xi \sin d$	9.00914	9.15039	9.21800
$\log \eta'$	6.64906	6.79031	6.85792
η'	+ 0.0004457	+ 0.000617	+ 0.000721
$x - \xi$	− 0.48959	+ 0.00004	+ 0.50299
$y - \eta$	+ 0.20688	− 0.000106	− 0.19917
$x' - \xi'$	+ 0.006443	+ 0.007197	+ 0.008066
$y' - \eta'$	− 0.002780	− 0.002956	− 0.003063
$\log m \sin M$	9.68983 *n*	5.60206	9.70156
$\log m \cos M$	9.31572	6.02531 *n*	9.29922 *n*
$\log \tan M$	0.37411 *n*	9.57675 *n*	0.40234 *n*
M	292° 54′ 26″	159° 19′ 33″	111° 36′ 7″
$\log \cos M$	9.59022	9.97109 *n*	9.56603*n*
$\log m$	9.72550	6.05422	9.73319
$\log n \sin N$	7.80909	7.85715	7.90666
$\log n \cos N$	7.44404 *n*	7.47070 *n*	7.48615 *n*
$\log \tan N$	0.36505 *n*	0.38645 *n*	0.42051 *n*
N	113° 20′ 19″	112° 19′ 45″	110° 47′ 38″

	Beginning.	Total phase.	Ending.
	h m	h m	h m
Greenwich Mean Time	17 12	18 24	19 30
log cos N	9.59788 n	9.57970 n	9.55024 n
log n	7.84616	7.89100	7.93591
log $\frac{m}{n}$	1.87934	8.16322	1.79728
log tan f (Penumbra)	7.66475		7.66476
log tan f (Umbra)		7.66264	
log ζ	9.88309	9 77477	9.60282
	7.54784	7.43741	7.26758
ζ tan f	0.0035305	0.002738	0.0018517
l (Penumbra)	0.5360600		0.5358200
l (Umbra)		− 0.009870	
L	+ 0.5325295	− 0.012608	+ 0.5339683
$M-N$	179° 34′ 7″	46° 59′ 48″	0° 48′ 29″
sin $(M-N)$	7.87674	9.86411	8.14930
log m	9.72550	6.05422	9.73319
	7.60224	5.91833	7.88249
log L	9.72634	8.10065 n	9.72751
sin ψ	7.87590	7.81768 n	8.15498
ψ	0° 25′ 50″	− 0° 22′ 35″	0° 49′ 7″
cos $(M-N)$	9.99999 n	9.83381	9.99996
log $\frac{m}{n}$	1.87934	8.16322	1.79728
	1.87933 n	7.99703	1.79724
$-\frac{m}{n}\cos(M-N)$	$+75^m.740$	$-0^m.00993$	$-62^m.696$
log L	9.72634	8.10065 n	9.72751
cos ψ	9.99999	9.99999	9.99996
	9.72633	8.10064 n	9.72747
log n	7.84616	7.89100	7.93591
	1.88017	0.20964 n	1.79156
$\mp\frac{L\cos\psi}{n}$	∓ 75.890	∓ 1.6204	± 61.880
τ_1	$-0^m.150$	$-1^m.63$	$-0^m.816$
τ_2		$+1^m.61$	
t	$17^h\ 12^m.000$	$18^h\ 24^m.00$	$19^h\ 30^m.000$
T	$17^h\ 11^m.850$		$19^h\ 29^m.184$

As the assumed times are very near the computed times, no correction is necessary. Therefore we have

Beginning of eclipse	17	11	51.0	Greenwich Mean Time.
Beginning of total eclipse	18	22	22.2	
End of total eclipse	18	25	36.6	
End of eclipse	19	29	11.0	

Angle of position:

	Beginning	Ending.
N	113° 20′.3	110° 47′.6
ψ (+ 180°)	180 25.8	0 49.1
P	292 54.5	111 36.7

Elements of Occultations.—Pages 419—452 give the elements for the prediction of the times of occultation of stars and planets by the moon. In the columns referring to the star, those headed *Red'ns from* 1887.0 give the quantities necessary to reduce the mean place of the star at the beginning of 1887 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

The quantities in the following five columns are all given for the moment of geocentric conjunction of the star and moon in right ascension. Let there be a line passing from the star through the centre of the moon, and let a plane perpendicular to this line pass through the centre of the earth: this plane will be the fundamental plane for the occultation. The system of co-ordinates is similar to that already described for eclipses. The cone circumscribing the moon and star may be regarded as a cylinder having everywhere the same diameter as the moon. This cylinder will intercept the fundamental plane in a circle of which the linear diameter will be the same as that of the moon.

The *Washington Mean Time* is the moment at which the two bodies are in geocentric conjunction in right ascension. At this moment the co-ordinate x of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour-Angle H* gives the common geocentric hour-angle of the moon and star at the same moment, counted from the meridian of Washington—positive toward the west and negative toward the east. Column Y gives the co-ordinate y of the axis of the cylinder upon the fundamental plane at the same moment. Columns x' and y' give the hourly variation of x and y. The linear unit in these columns is the earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the Washington mean time of immersion and emersion of a star behind the limb of the moon may be computed for any part of the earth by a method nearly the same as that already explained for computing eclipses, only more simple.

We shall first show how to compute an isolated occultation for a particular place, assuming it to be visible at that place, and then show how all the occultations which will be visible at a place may be selected and computed by a more rapid process.

(1) The geocentric co-ordinates of the place, $\rho \sin \varphi'$ and $\rho \cos \varphi'$, are to be computed with three or four places of decimals by the formulæ,

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

$$\rho \cos \varphi' = F \cos \varphi$$

already given in connection with the eclipses.

As in the case of eclipses, it is necessary to have an approximate time of the phenomenon, corresponding to that obtained from the charts of the eclipses. The quantity H being the Washington west hour-angle of the two bodies at the moment of geocentric conjunction, $H - \lambda$ will be the local hour-angle of the star at this same moment. Let us call this angle h_0, putting

$$h_0 = H - \lambda$$

where λ is the longitude west of *Washington.*

The next step will then be to find the approximate moment of apparent conjunction in right ascension as seen from the place. An approximate correction to reduce the time and hour-angle for geocentric conjunction to those for apparent conjunction may be taken from Mr. DOWNES's table, on pages 451—452. This correction will have the same sign as h_0.

When this table is not available, the correction may be computed thus: Compute the quantities ξ_0, ξ' and τ from the formulæ,

$$\begin{aligned} \xi_0 &= \rho \cos \varphi' \sin h_0 \\ \xi' &= [9.4192] \cos (h_0 + \tfrac{1}{3} h_0) \\ \tau &= \frac{\xi_0}{x' - \xi'} \end{aligned}$$

τ will then be the approximate interval between the times of geocentric and local conjunction. By applying it to the Washington mean time of the former, as given with the elements, we shall have the Washington mean time of the latter within a few minutes.

The average duration of an occultation is about an hour. Thence, by adding $0^h.5$ to and subtracting it from the mean time of apparent conjunction, we shall have rough times of the phases of immersion and emersion for farther computation. Let us then put,

$\tau_1 = \tau - 0^h.5$

$\tau_2 = \tau + 0^h.5$

T, the Washington mean time of geocentric conjunction in R. A.

d, the declination of the star.

(2) Compute for the moments $T + \tau_1$ and $T + \tau_2$ the following quantities, in which we write τ for each of the quantities τ_1 and τ_2. The latter, when used as angles, are to be changed to arc by multiplying by 15°, and the minutes are to be further increased by one-sixth the number of degrees in order to reduce to the sidereal hour-angle.

$$\begin{aligned}
\xi &= \rho \cos \varphi' \sin (h_0 + \tau) \\
\eta &= \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (h_0 + \tau) \\
\xi' &= [9.4192]\, \rho \cos \varphi' \cos (h_0 + \tau) \\
\eta' &= [9.4192]\, \rho \cos \varphi' \sin d \sin (h_0 + \tau) = [9.4192]\, \xi \sin d \\
x &= x' \tau \\
y &= Y + y' \tau
\end{aligned}$$

Compute m, M, n and N from the equations

$$\begin{aligned}
m \sin M &= x - \xi \\
m \cos M &= y - \eta \\
n \sin N &= x' - \xi' \\
n \cos N &= y' - \eta' \\
n' &= \frac{n}{60} = [8.2218]\, n \\
\sin \psi &= [0.5650]\, m \sin (M - N)
\end{aligned}$$

Then, t_1 and t_2 from the equations

$$t_1 = -\frac{m}{n'} \cos (M - N) - \frac{[9.4350]}{n'} \cos \psi \quad \text{(Beginning.)}$$

$$t_2 = -\frac{m}{n'} \cos (M - N) + \frac{[9.4350]}{n'} \cos \psi \quad \text{(End.)}$$

The quantities t_1 and t_2 will then be the corrections in minutes to be applied to the respective times $T + \tau_1$ and $T + \tau_2$ to obtain the Washington mean times of the phases.

As in the case of eclipses, the small value of t_1 will give an accurate result for one phase, and the large value an inaccurate result for the other. Both accurate results may then be corrected by comparison with the inaccurate one, in the way described for eclipses, and a result obtained which will probably be correct within a fraction of a minute of time.

As a check upon the result, it will be advisable to compute ξ, η, x and y for the moments finally obtained. If the times are correct these quantities will fulfil the condition,

$$\sqrt{(x - \xi)^2 + (y - \eta)^2} = 0.2723$$

If $\log m \sin (M - N) = 9.4350$ nearly, a recalculation will generally be necessary to determine whether, numerically, $\sin \psi < 1$, or $\sin \psi > 1$. In the latter case, the impossible value of $\sin \psi$ indicates that an occultation at the given place is impossible, unless the computed distance from the moon's limb is within the errors of the ephemerides of the moon and star.

In such cases of near approach to the moon's limb, we may take $\psi = 90°$, or 270°, according as $\sin (M - N)$ is positive or negative; and for finding the time of nearest approach,

$$t = -\frac{m \cos (M - N)}{n'}$$

Putting π for the moon's horizontal parallax, the distance from the moon's limb will be,

$$\pi\ [m \sin (M - N) - 0.2723]$$

disregarding the sign of $\sin (M - N)$; or, allowing for the augmentation of the semidiameter,

$$\pi\ [m \sin (M - N) - 0.2723]\ [1 + z \sin \pi]$$

where

$$z = \rho \cos \varphi' \cos d \cos (h_0 + \tau) + \rho \sin \varphi' \sin d$$

The position-angle, P, of the line from the moon's centre to the star at the times of contact, reckoned from the north point toward the east, is given by the formulæ: —

$$P = N - \psi \qquad \text{for immersion,}$$
$$P = N + \psi \pm 180^\circ \qquad \text{for emersion,}$$

it being supposed that the value of ψ, in each case, is taken between the limits ± 90°.

To find the angle from the vertex, we compute the angle C from the formula,

$$\tan C = \frac{\xi + t\,\xi'}{\eta + t\,\eta'}$$

in which the value of t corresponding to the phase is to be used. Then

$$V = P - C$$

is the angle from the vertex, also reckoned from the north toward the east.

As an example of an isolated occultation, we shall compute that of α Tauri, 1887, January 6, for Annapolis, whose position is

$$\varphi = +\ 38^\circ\ 58'\ 53''.5$$
$$\lambda = -\ 0^h\ 2^m\ 15^s.60$$

Constants for the given place, $\log \rho \sin \varphi' = 9.79636$

$\log \rho \cos \varphi' = 9.89120$

From the table of elements, page 419 $H = -\ 2^h\ 39^m.0$

Hence $h_0 = H - \lambda = -\ 2^h\ 36^m.74$

From DOWNES's Table, pages 451—452, or from the formulæ on page 508, we find the correction to the time of apparent conjunction to be about -60^m. Applying this to the Washington mean time of geocentric conjunction as given in the elements (page 419), we have the approximate Washington mean time of apparent conjunction, viz: $5^h\ 45^m.5$. As the duration is estimated to be about 52^m, we will therefore subtract and add 26^m and we shall have the approximate Washington mean times of immersion and emersion to be used in the computation; thus:

For Immersion, $\tau_1 = -\ 1^h.433$; $T_1 =$ Jan. 6, $5^h\ 19^m.5$

For Emersion, $\tau_2 = -\ 0.566$; $T_2 =$ Jan. 6, 6 11.5

	Immersion.	Emersion.
	h m	h m
h_0	− 2 39.0	− 2 39.0
τ (in sidereal time)	− 1 26.235	− 0 34.093
$h_0 + \tau$	− 4 5.235	− 3 13.093
$h_0 + \tau$ (in arc)	−61° 18′ 31″.5	−48° 16′ 22″.7
$\sin d$	9.44767	9.44767
$\cos d$	9.98223	9.98223
$\rho \cos \varphi'$	9.89120	9.89120
$\sin (h_0 + \tau)$	9.94310 n	9.87292 n
$\log \xi$	9.83430 n	9.76412 n
ξ	− 0.68281	− 0.58092

	Immersion.	Emersion.
$\rho \sin \varphi'$	9.79636	9.79636
$\cos d$	9.98223	9.98223
$\log \varphi \sin \varphi' \cos d$	9.77859	9.77859
(1)	+ 0.60060	+ 0.60060
$\rho \cos \varphi' \sin d$	9.33887	9.33887
$\cos (h_0 + \tau)$	9.68132	9.82321
$\log \rho \cos \varphi' \sin d \cos (h_0 + \tau)$	9.02019	9.16208
(2)	+ 0.10476	+ 0.14524
(1)–(2) η	+ 0.49584	+ 0.45536
(const.) log	9.41920	9.41920
$\rho \cos \varphi'$	9.89120	9.89120
$\cos (h_0 + \tau)$	9.68132	9.82321
$\log \xi'$	8.99172	9.13361
ξ'	+ 0.09811	+ 0.13602
(const.) log	9.41920	9.41920
$\xi \sin d$	9.28197 *n*	9.21179 *n*
$\log \eta'$	8.70117 *n*	8.63099 *n*
η'	− 0.05025	− 0.04275
$\log x'$	9.75808	9.75808
$\log \tau$	0.15634 *n*	9.75332 *n*
$\log x$	9.91442 *n*	9.51140 *n*
x	− 0.82114	− 0.32464
ξ	− 0.68281	− 0.58092
$x - \xi$	− 0.13833	+ 0.25628
$\log y'$	8.98989	8.98989
$\log \tau$	0.15634 *n*	9.75332 *n*
	9.14623 *n*	8.74321 *n*
$y' \tau$	− 0.14003	− 0.05536
Y	+ 0.40340	+ 0.40340
$Y + y' \tau = y$	+ 0.26337	+ 0.34804
η	+ 0.49584	+ 0.45536
$y - \eta$	− 0.23247	− 0.10732
$x' - \xi'$	+ 0.47479	+ 0.43688
$y' - \eta'$	+ 0.14795	+ 0.14045
$\log m \sin M$	9.14091 *n*	9.40871
$\log m \cos M$	9.36636 *n*	9.03068 *n*
$\tan M$	9.77455	0.37803 *n*
M	210° 45′ 17″	112° 43′ 20″
$\sin M$	9.70873 *n*	9.96491
$\log m$	9.43218	9.44380
$\log n \sin N$	9.67650	9.64036
$\log n \cos N$	9.17012	9.14752
$\tan N$	0.50638	0.49284
N	72° 41′ 30″	72° 10′ 42″

	Immersion.	Emersion.
$\cos N$	9.47351	9.48580
$\log n$	9.69661	9.66172
const. log	8.22180	8.22180
$\log n'$	7.91841	7.88352
$M - N$	138° 3′ 47″	40° 32′ 38″
$\sin (M - N)$	9.82498	9.81293
$\log m$	9.43218	9.44380
const. log	0.56500	0.56500
$\sin \psi$	9.82216	9.82173
ψ	138° 23′ 43″	41° 33′ 17″
$\cos (M - N)$	9.87151 n	9.88076
$\log \frac{m}{n}$	1.51377	1.56028
$\cos \psi$	9.87375 n	9.87409
$[9.4350] \div n'$	1.51659	1.55148
$-\frac{m}{n'} \cos (M - N)$	$24^{\mathrm{m}}.281$	$-\ 27^{\mathrm{m}}.608$
$\frac{[9.4350]}{n'} \cos \psi$	∓ 24.566	± 26.642
t_1	− 0.285	− 0.966
t_2 (inaccurate)	+ 48.847	− 54.250
Washington conjunction + τ	5^{h} 19.500	6^{h} 11.500
Washington mean time of phase, Jan. 6,	5^{h} 19.215	6^{h} 10.534
$-\lambda$	+ 2.260	+ 2.260
Annapolis mean time of phase, Jan. 6,	5^{h} 21.475	5^{h} 12.794

These results being very near the assumed times, require no correction. When a correction is considered necessary, it may be computed in the same way as described for eclipses, but for the mere purpose of prediction, it need be executed only for the emersion.

The position angles (Q) are

	At Immersion.		At Emersion.	
N	72°	41′.5	72°	10′.6
ψ	138	23.6	41	33.3
	− 180		+ 180	
Q	31	5.1	293	43.9

Prediction of Many Occultations for a Given Place.—When it is desired to predict all the occultations which will be visible at some one place, tables may be constructed and applied in such a way as to greatly diminish the labor of computation. In using such tables, the most convenient course will be to find for each occultation the hour-angle of the star at the moment of apparent conjunction in right ascension, as seen from the place of observation. The table of elements, pages 419—447, gives H, the Washington hour-angle at the moment of geocentric conjunction. The corresponding geocentric hour-angle at the place will be

$$h_0 = H - \lambda \qquad (\lambda = \text{west longitude from Washington}).$$

The moment of apparent conjunction, as seen from the station, will be given by the condition $\xi = x$; or, using the values of ξ and x,

$$\rho \cos \varphi' \sin h = x' \tau$$

h being the west hour-angle of the star at the moment in question, and τ the interval, in hours of mean time, which has elapsed since geocentric conjunction. We shall therefore have,

$$h = h_0 + \tau$$

for the hour-angle at the end of the interval τ after geocentric conjunction. In strictness, τ should here be multiplied by the factor $1 + \frac{1}{365.25}$, because the star moves a little more than 15° in an hour of mean time; but the error arising from the neglect of the factor is too small to be important, as it will affect the predicted time of conjunction by less than 10 seconds. The equation for finding τ is therefore,

$$\rho \cos \varphi' \sin (h_0 + \tau) = x' \tau$$

The quantities h_0 and x' being derived immediately from the data of the Ephemeris, the quantity τ is readily obtained by successive approximation, and may be tabulated as a function of h_0 and x'. The computation of τ is effected as follows: We have

$$\sin (h_0 + \tau) = \sin h_0 + 2 \sin \tfrac{1}{2} \tau \cos (h_0 + \tfrac{1}{2} \tau) \qquad (1)$$

The value of τ in arc being seldom more than 24° we may put τ itself for $2 \sin \frac{1}{2} \tau$. The equation will then become

$$\rho \cos \varphi' \sin h_0 + \tau \rho \cos \varphi' \cos (h_0 + \tfrac{1}{2} \tau) = x' \tau$$

from which we find

$$\tau = \frac{\rho \cos \varphi' \sin h_0}{x' - k \rho \cos \varphi' \cos (h_0 + \frac{1}{2} \tau)} \qquad (2)$$

To tabulate τ, we must first have a table of the quantities

$$\begin{aligned} \xi &= \rho \cos \varphi' \sin h \\ \xi' &= [9.41916] \rho \cos \varphi' \cos h \end{aligned} \qquad (3)$$

which table may be formed for every 10 minutes (in time) of h. If we then put ξ_0 for the value of ξ corresponding to $h = h_0$ and ξ'_1 for the value of ξ' corresponding to $h = h_0 + \frac{1}{2} \tau$, we shall have

$$\tau = \frac{\xi_0}{x' - \xi'_1} \qquad (4)$$

Since we must know the value of τ, approximately, before we can take ξ'_1 from the table, this equation can be solved only by successive approximations. The approximations converge so rapidly as to offer no difficulty. It will be best to begin by computing values of τ for the two extremes of x', namely, $x' = 0.48$ and $x' = 0.60$, because the approximate values of τ can then be interpolated for all intermediate values of x'. For the first approximation may be taken—

$$\begin{aligned} \tfrac{1}{2} \tau &= 50^{\mathrm{m}} \sin \tfrac{4}{3} h_0 \quad (\text{for } x' = 0.48) \\ \tfrac{1}{2} \tau &= 40^{\mathrm{m}} \sin \tfrac{4}{3} h_0 \quad (\text{for } x' = 0.60) \end{aligned} \qquad (5)$$

or, the approximate values of τ may be taken from Mr. DOWNES's table, pages 451—452. It will be best to make the computation for every 30^{m} of h_0, and to find the intermediate values of τ for every 10^{m} by interpolation. Then for each 30^{m} of h_0 we take ξ' from a table with the argument $h_0 + \frac{1}{2} \tau$, and $\log \xi$ with the argument h_0, and thence compute τ by (4). If the value of τ thus arrived at differs more than 3^{m} from that employed in taking out ξ', a new value may be used to correct ξ', and the computation may be repeated. The values corresponding to $x' = 0.51$, $x' = 0.54$, and $x' = 0.57$, can then be computed with the single interpolation of approximate values of τ, and afterward the table can be extended by interpolation to every 0.01 of x' between $x' = 0.48$ and $x' = 0.62$. It will be best to compute τ in the first place to every 0.001 of an hour, and to drop the last figure in forming the definitive table. The table thus formed will be called *Table I.*

The values of η and η' may then be tabulated for every degree of the star's declination, and every 10^m of h. It will not be really necessary to compute the table for negative values of d, since by putting

$$\begin{aligned} \eta_1 &= \quad \rho \sin \varphi' \cos d \\ \eta_2 &= -\rho \cos \varphi' \sin d \cos h \end{aligned}$$

η_1 may be given in a table of single-entry; and taking η_2 from the table of double-entry for a positive d, we shall have

$$\eta = \eta_1 \pm \eta_2$$

the lower sign being used for a negative d. But the extension of the table for η to negative values of d is so readily made that it will probably be found better to do it, so as to save taking out η_1 and η_2 separately.

This table for η will be called *Table II*, and the corresponding one for η' with the same arguments *Table III.* The precepts for using the tables will then be as follow:—

From Table I with the arguments x' and $H - \lambda = h_0$ take out the value of τ. It will be sufficient to use the nearest 0.01 of x'. τ will be of the same sign as h_0. Then, enter Table II with the arguments d (the star's declination) and $h = h_0 + \tau$, and take out the value of η. Form the quantities $y = Y + y'\tau$, and $y - \eta$. If the latter quantity lies between the limits ± 0.28, it is almost certain that there will be an occultation. If it falls without the limits ± 0.33, it is almost certain that there will not be an occultation. Between the years 1881 and 1890 these last limits may be reduced to ± 0.32, and cases near this limit may be rejected if y' is small. A convenient rule to adopt will be—

$$\begin{array}{rl} y' < 0.10, & \text{limits} = \pm\ 0.29 \\ 10 < y' < 0.15, & \text{limits} = \pm\ 0.30 \\ 15 < y' < 0.20, & \text{limits} = \pm\ 0.31 \\ 20 < y' \qquad\quad & \text{limits} = \pm\ 0.33 \text{ or } \pm\ 0.32 \end{array}$$

Here, only the absolute value of y' is to be considered, without respect to its algebraic sign.

If $y - \eta$ falls between the limits thus indicated, take the values of ξ' and η' from the appropriate tables and compute v, Q and Δ from the equations

$$\begin{aligned} v \sin Q &= y' - \eta' \\ v \cos Q &= x' - \xi' \\ \Delta &= (y - \eta) \cos Q \end{aligned}$$

If $\Delta > 0.2723$ or $\log \Delta > 9.4350$ there will be no occultation, though the moon may graze the star when $\Delta - 0.2723$ is very small. If $\Delta < 0.2723$, compute

$$\tau_1 = -\frac{y - \eta}{v} \sin Q \qquad \cos P = \frac{\Delta}{0.2723} \qquad (P < 180^\circ)$$

$$\tau_2 = \frac{0.2723 \sin P}{v} \cdot$$

We shall then have—

Local mean time of immersion, $T - \lambda + \tau + \tau_1 - \tau_2$
Local mean time of emersion, $T - \lambda + \tau + \tau_1 + \tau_2$

Position-angle from north toward east at immersion, $180^\circ - Q - P$
Position-angle from north toward east at emersion, $180^\circ - Q + P$

In predicting the occultations for a given place, the first operation will be to go over the list of occultations in the Ephemeris, and select those which may be visible. The conditions of possible visibility are:—

1. The limiting parallels in the last columns must include the latitude of the place.

2. The quantity $H-\lambda$, taken without regard to sign, must be less than the semi-diurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east horizon, or an immersion in the west, when this difference is a few minutes less than an hour.

3. The sun must not be much more than an hour above the horizon at the local mean time $T-\lambda$, unless the star is bright enough to be seen in the day time.

The most cconvenient course will be to write the value of $-\lambda$ on the bottom of a sheet of paper, and, passing through the list of occultations, pause over each one for which condition (1) is fulfilled, and examine whether conditions (2) and (3) are fulfilled. If either fails, the computer passes on. Very often it will require some examination to find whether $H-\lambda$ or $T-\lambda$ falls within the limits; in these cases, the computer may mark the occultation for trial and leave the decision for the subsequent operations. The whole list can be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

Phenomena of Planets and Satellites, pages 453—485.—These are, for the most part, sufficiently explained in the body of the work. The following additional explanations are added for completeness.

Disks of Mercury and Venus, pages 453—454.—The angle θ, needed in reducing meridian observations, is the angle which the arc of the great circle from the planet to the sun, makes with the arc from the planet toward the west, reckoned in the direction west, north, east, south. This position-angle is reckoned from 0° to 360°, as in the measurement of double stars, the planet taking the place of the central star. But its measure is 90° greater than that of a double star.

We may also regard θ as expressing the angle which the line of cusps makes with the meridian, the positive direction of the meridian being toward the north, and the positive direction of the line of cusps that in which a person following this line would have the centre of the planet upon his right.

Satellites of Jupiter, pages 455—479.—The times of phenomena are explained at the foot of each page; the diagram is on page 455.

Phenomena, pages 486—487.—The conjunctions, quadratures, and oppositions of the planets with respect to the sun, give the hours when the longitude of each planet differs from that of the sun by 0°, 90° or 180°.

The conjunctions of the moon and planets with each other are given in right ascension. The degrees and minutes to the right show the difference of declination at the moment of conjunction.

Latitude by Observed Altitude of Polaris.—Table IV replaces the Tables A, B, C, D, given as a *Supplement* to the volumes of the Ephemeris for 1874—1881, and is intended for use at sea and reconnaissance on land. It will furnish an approximate value of the latitude, the probable error of which, in so far as the table is concerned, will be a few tenths of a minute of arc.

The directions for using the table are adapted to a right ascension of Polaris equal to $1^h\ 18^m$. Somewhat greater accuracy may be insured by substituting the right ascension of Polaris at the date of observation, from pages 302—313 of this volume.

APPENDIX.

ON THE CONSTRUCTION OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC FOR 1887.

The adopted constants of precession, nutation, and aberration are those of **Struve** and **Peters**, namely:—

$$\begin{array}{lcl} \text{Precession} & = & 50''.2411 + 0''.0002268\ t \\ \text{Nutation} & = & 9''.2231 + 0''.000009\ \ t \\ \text{Aberration} & = & 20''.4451 \end{array}$$

in which t is the number of years after 1800.0.

The obliquity of the ecliptic is that of **Hansen**'s *Tables du Soleil*, which is 0''.31 greater than that of **Peters**, given in the issues of this Ephemeris preceding that for 1882. A comparison of **Hansen**'s mean obliquity with that of **Peters** and of **Le Verrier** at different epochs is given in the following table:—

Epoch.	Hansen.			Peters.	Le Verrier.	H.—P.	H.—L.
	°	′	″	″	″	″	″
1750	23	28	18.19	17.44	19.42	+0.75	−1.23
1800	23	27	54.80	54.22	55.63	+0.58	−0.83
1850	23	27	31.42	30.99	31.83	+0.43	−0.41
1900	23	27	8.02	7.76	8.03	+0.26	−0.01

The formulæ for reducing the places of the fixed stars, page 280, correspond to the *Star Tables of the American Ephemeris*, Washington, 1869.

The mean right ascensions of stars have been reduced to **Newcomb**'s fundamental standard in the catalogue attached to the *Washington Observations for* 1870, Appendix II, with the following exceptions: The right ascensions of the 48 circumpolar stars north of 60° north declination are from Dr. **Gould**'s *Standard Places of Fundamental Stars*, second edition, United States Coast Survey Office, 1866. Of the twelve stars south of 50° south declination, the positions of β Hydri, α Trianguli Australis, and σ Octantis, have been corrected from data furnished by Dr. **Gould**; while the remaining nine are, as before, from the *British Nautical Almanac* for 1848.

The right ascensions of additional stars in the general list, for which no apparent places are given in the subsequent section, have been taken partly from the *Catalogue of* 1098 *Standard Clock and Zodiacal Stars*, forming Part IV of Vol. I of *Astronomical Papers Prepared for the Use of the American Ephemeris and Nautical Almanac*, Washington, 1881; and partly from the catalogue of the Astronomische Gesellschaft of 1878. A few have been derived from recent catalogues without a rigorous reduction for equinox.

The mean declinations of stars are taken from Boss's paper in the *Report of the Northern Boundary Commission*, Washington, 1879, for all stars found therein. The declinations of all the other stars have been reduced to the same standard, except those of the additional ones above, which have been taken partly from the Astronomische Gesellschaft list, and partly from places in recent catalogues. To the apparent places of Sirius and Procyon have been applied the periodic corrections resulting from **Auwers**'s investigations.

The values of these corrections are:—

Year.	Sirius.		Procyon.	
1887.0	$\Delta\alpha = +\overset{s}{0}.040$	$\Delta\delta = -\overset{''}{1}.13$	$\Delta\alpha = +\overset{s}{0}.015$	$\Delta\delta = +\overset{''}{1}.02$
1888.0	$\Delta\alpha = +0.063$	$\Delta\delta = -0.97$	$\Delta\alpha = +0.026$	$\Delta\delta = +0.97$

The ephemeris of the sun is constructed from **Hansen** *and* **Olufsen**'s *Tables du Soleil*, Copenhagen, 1853, except that **Struve**'s aberration has been used. This is equivalent to adding 0″.19 to the true longitudes, but it does not affect the right ascensions and declinations. The sun's rectangular equatorial co-ordinates have been computed from the longitudes and latitudes by the following formulæ:—

$$\begin{aligned} X &= R \cos \lambda \\ Y &= R \sin \lambda \cos \omega - 19.3\, R\, \beta \\ Z &= R \sin \lambda \sin \omega + 44.5\, R\, \beta \end{aligned}$$

The reductions to mean equinox, 1887.0, are computed by the formulæ,

$$\begin{aligned} \Delta X' &= + Y \sec \omega\, \Delta \lambda \sin 1'' \\ \Delta Y' &= - X \cos \omega\, \Delta \lambda \sin 1'' + Z\, \Delta \omega \sin 1'' - 9.4\, \tau\, R \sin(\lambda + 187^\circ) \\ \Delta Z' &= - X \sin \omega\, \Delta \lambda \sin 1'' - Y\, \Delta \omega \sin 1'' + 21.7\, \tau\, R \sin(\lambda + 187^\circ) \end{aligned}$$

Wherein—

λ and β	are the longitude and latitude of the sun referred to the equinox and ecliptic of the date;
ω,	the obliquity of the ecliptic;
$\Delta\lambda$,	the reduction of longitude for precession and nutation from January 0;
$\Delta\omega$,	the reduction of the mean to the apparent obliquity;
τ,	the fraction of the year since January 0.

The numerical coefficients are in units of the seventh place of decimals. The correction for latitude has been taken from **Goetze**'s paper in the *Astronomical Journal*, Vol. II, page 71.

The mean equatorial horizontal parallax of the sun, adopted from Professor **Newcomb**'s *Investigation of the Distance of the Sun and the Elements which depend on it*,* is 8″.848. The adopted semi-diameter of the sun at the earth's mean distance is 16′ 2″. In the computations pertaining to eclipses, **Bessel**'s semidiameter, 15′ 59″.788 has been used.

The right ascension, declination and parallax of the moon are derived from **Hansen**'s *Tables de la Lune*, London, 1857, the mean longitude being corrected in accordance with **Newcomb**'s *Researches on the Motion of the Moon*, Part I, page 268,† and a corrected table being substituted for Table XXXIV.

The semidiameter of the moon is computed from the moon's horizontal parallax by the formula,

$$S = 0.272274\, \pi + 2''.5$$

The constant 2″.5 is omitted in the computation of eclipses and occultations, as due entirely to telescopic and ocular irradiation.

The ephemeris of Mercury is derived from Professor **Winlock**'s *Tables of Mercury*, Washington, 1864. They are based on the older theory of **Le Verrier**, published in the Additions to the *Connaissance des Temps* for 1848.

The ephemeris of Venus is derived from Mr. G. W. **Hill**'s *Tables of Venus*, Washington, 1872.

The ephemeris of Mars is derived from manuscript tables constructed from **Lindenau**'s Tables. Mr. **Hugh Breen**'s results, contained in his paper *On the Corrections of* **Lindenau**'s *Elements of Mars*, published in the *Memoirs of the Royal Astronomical Society*, Vol. XX, have also been discussed and applied; and **Le Verrier**'s secular variations of the elements are likewise adopted. The perturbations produced by Jupiter have been increased by $\frac{1}{30}$ of their value. The following are the corresponding corrected elements and annual variations for Washington, 1855.0:—

$$\begin{aligned} L &= 320^\circ\ 13'\ 33''.87 &+&\ 689101''.1527\ t \\ \pi &= 333\ \ 23\ \ 17.84 &+&\ 65.9990\ t \\ \Omega &= 48\ \ 25\ \ 55.29 &+&\ 27.6997\ t \\ i &= 1\ \ 51\ \ \ 2.20 &-&\ 0.02141\ t \\ e &= 19238''.75 &+&\ 0.18549\ t \\ n &= 689050''.8927 && \\ a &= 1.5236915 && \end{aligned}$$

The ephemeris of Jupiter is derived from manuscript tables constructed from **Bouvard**'s Tables, with such changes as were required to make them correspond more nearly to the formulæ.

The ephemeris of Saturn is derived from a provisional theory constructed by Mr. **George W. Hill**, and still unpublished.

The ephemerides of Uranus and Neptune are derived from Professor **Newcomb**'s Tables, published by the *Smithsonian Institution*.

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* *Astronomical Observations made at the U. S. Naval Observatory, Washington*, 1865, Appendix II.

† *Astronomical Observations made at the U. S. Naval Observatory, Washington*, 1875, Appendix II.

The semidiameters of the planets are computed from the following values:—

	Semidiameter.	Log Dist.	Authority.
Mercury	3″.34 ″	0.00	Le Verrier, *Theory of Mercury.*
Venus	8.546 ± 0.086	0.00	Peirce, from the Washington Observations of 1845 and 1846, made with the Mural Circle.
Mars	2.842 ± 0.057	0.25	
Jupiter (polar)	18.78 ± 0.067	0.70	
Saturn (polar)	8.77 ± 0.039	0.95	
Uranus	1.68 ± 0.3	1.30	
Neptune	1.28	1.48	
Jupiter (equatorial)	20.00	0.70	
Saturn (equatorial)	9.38	0.95	

The elements of eclipses of the sun and occultations of stars by the moon are adapted to **Bessel**'s method, using the special forms in **Chauvenet**'s *Spherical and Practical Astronomy.* The adopted semidiameters are:—

Semidiameter of the sun at distance unity. . . .	959″.788
Ratio of radius of moon to radius of earth . . .	0.27227

The eclipses of Jupiter's satellites are computed from **Todd**'s *Continuation of* **Damoiseau**'s *Tables*, Washington, 1876. The occultations, transits, etc., are computed from **Woolhouse**'s Tables, *British Nautical Almanac* for 1835, Table II of each satellite having been adapted to **Damoiseau**'s Tables.

The elongations and conjunctions of the satellites of Saturn are computed from manuscript tables prepared by Professor **Newcomb**.

The apparent elements of the rings of Saturn are computed from **Bessel**'s data, except those for the dusky ring.

The elongations of the satellites of Uranus, and of the satellite of Neptune are computed from the data of Professor **Newcomb**'s *Uranian and Neptunian Systems*, Washington, 1875.

In compiling the positions of observatories, the latest available data have been used. The positions have been furnished, in many instances, through the courtesy of the directors of the Observatories, in response to a circular issued by the Superintendent of the American Ephemeris.

The reduction to geocentric latitude, and the logarithm of the radius of the earth, are derived from **Bessel**'s elements of the terrestrial spheroid, as adopted in Table III of **Chauvenet**'s *Spherical and Practical Astronomy*, Vol. II:—

$$\log e = 8.9122052$$

$$\varphi' - \varphi = -\,11'\,30''.65 \sin 2\varphi + 1''.16 \sin 4\varphi$$

$$\log \rho = 9.9992747 + 0.0007271 \cos 2\varphi - 0.0000018 \cos 4\varphi$$

Table IV, for finding the latitude from an observed altitude of Polaris, is constructed for—

(1) An altitude of Polaris equal to 45°.

(2) A declination of Polaris equal to + 88° 42′.1.

The principal computations of the Ephemeris have been distributed in the following manner:—

The sun has been computed by Mr. **Eastwood**; the moon's longitude, latitude, semidiameter and horizontal parallax, by Professor **Keith**; right ascension and declination, by Professor **Van Vleck**; culminations, by Professor **Runkle**; lunar distances, by Mr. W. B. **Oliver**; Mercury and Venus, by Mr. E. P. **Austin**; Mars, Jupiter, Saturn, Uranus, and Neptune, by Mr. **Roberdeau Buchanan**; Jupiter's satellites, by Mr. W. F. McK. **Ritter**. The fixed stars have been prepared by Mr. **Wiessner** and Mr. H. **Meier**; the general constants for their reduction, by Mr. **Wiessner**; the occultations, by Mr. J. O. **Wiessner**; and the eclipses have been computed and the charts projected by Mr. **Buchanan**.

TABLE I.

CORRECTION REQUIRED, ON ACCOUNT OF SECOND DIFFERENCES OF THE MOON'S MOTION, IN FINDING THE GREENWICH TIME CORRESPONDING TO A CORRECTED LUNAR DISTANCE.

Difference of the Proportional Logarithms in the Ephemeris.

Approximate Interval.		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
0 20	2 40	0	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
0 30	2 30	0	1	1	2	2	2	2	3	3	3	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9
0 40	2 20	0	1	1	2	2	3	3	3	4	4	5	5	6	6	6	7	7	8	8	9	9	10	10	10	11	11
0 50	2 10	1	1	2	2	3	3	4	4	5	5	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13
1 0	2 0	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13	14	14
1 10	1 50	1	1	2	2	3	4	4	5	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	15
1 20	1 40	1	1	2	3	3	4	4	5	6	6	7	7	8	9	9	10	10	11	12	12	13	14	14	15	15	16
1 30	1 30	1	1	2	3	3	4	4	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16

Difference of the Proportional Logarithms in the Ephemeris.

		54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	7
0 20	2 40	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12
0 30	2 30	9	10	10	10	11	11	12	12	12	13	13	13	14	14	14	14	15	15	16	16	16	17	17	17
0 40	2 20	12	12	13	13	13	14	14	15	15	16	16	16	17	17	18	18	19	19	19	20	20	21	21	22
0 50	2 10	14	14	15	15	16	16	16	17	17	18	19	19	20	20	21	21	22	22	22	23	23	24	24	25
1 0	2 0	15	16	16	17	17	18	18	19	19	20	21	21	22	22	23	23	24	24	25	25	26	27	27	28
1 10	1 50	16	17	17	18	18	19	19	20	21	21	22	22	23	24	24	25	25	26	27	27	28	28	29	30
1 20	1 40	17	17	18	19	19	20	20	21	21	22	23	23	24	25	25	26	26	27	28	28	29	29	30	31
1 30	1 30	17	18	18	19	19	20	21	21	22	23	23	24	24	25	25	26	27	27	28	29	29	30	31	31

Difference of the Proportional Logarithms in the Ephemeris.

		102	104	106	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	9	9	9	9
0 20	2 40	13	13	13	13	14	14	14	14	15	15	15	15	15	16	16	16	16	17	17
0 30	2 30	18	18	18	19	19	19	20	20	20	21	21	21	22	22	22	23	23	24	24
0 40	2 20	22	22	23	23	24	24	25	25	25	26	26	27	27	28	28	28	29	29	30
0 50	2 10	26	26	26	27	27	28	29	29	29	30	30	31	31	32	32	33	33	34	34
1 0	2 0	28	29	29	30	30	31	31	32	33	33	34	34	35	35	36	37	37	38	38
1 10	1 50	30	31	31	32	32	33	34	34	35	35	36	37	37	38	38	39	40	40	41
1 20	1 40	31	32	33	33	34	34	35	35	36	37	38	38	39	39	40	41	41	42	42
1 30	1 30	32	32	33	34	34	35	35	36	36	37	38	39	39	40	40	41	42	42	43

The correction is to be added to the approximate Greenwich time when the proportional logarithms in the Ephemeris are decreasing, and subtracted when they are increasing.

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Side-real.	$0^{h.}$	$1^{h.}$	$2^{h.}$	$3^{h.}$	$4^{h.}$	$5^{h.}$	$6^{h.}$	$7^{h.}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 8.807	0	0.000
1	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	1	0.003
2	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2	0.005
3	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3	0.008
4	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4	0.011
5	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 9.626	5	0.014
6	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6	0.016
7	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 0.124	1 9.954	7	0.019
8	0 1.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8	0.022
9	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9	0.025
10	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 0.616	1 10.445	10	0.027
11	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11	0.030
12	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12	0.033
13	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13	0.035
14	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14	0.038
15	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15	0.041
16	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16	0.044
17	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17	0.046
18	0 2.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 1.926	1 11.756	18	0.049
19	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19	0.052
20	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20	0.055
21	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21	0.057
22	0 3.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 2.582	1 12.411	22	0.060
23	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23	0.063
24	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24	0.066
25	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25	0.068
26	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26	0.071
27	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27	0.074
28	0 4.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28	0.076
29	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29	0.079
30	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30	0.082
31	0 5.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31	0.085
32	0 5.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32	0.087
33	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33	0.090
34	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54.718	1 4.547	1 14.377	34	0.093
35	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35	0.096
36	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36	0.098
37	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37	0.101
38	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38	0.104
39	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39	0.106
40	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40	0.109
41	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41	0.112
42	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42	0.115
43	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 6.022	1 15.851	43	0.117
44	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44	0.120
45	0 7.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 6.350	1 16.179	45	0.123
46	0 7.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 6.513	1 16.343	46	0.126
47	0 7.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 6.677	1 16.507	47	0.128
48	0 7.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 6.841	1 16.671	48	0.131
49	0 8.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 7.005	1 16.834	49	0.134
50	0 8.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 7.169	1 16.998	50	0.137
51	0 8.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 7.332	1 17.162	51	0.139
52	0 8.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 7.496	1 17.326	52	0.142
53	0 8.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 7.660	1 17.490	53	0.145
54	0 8.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 7.824	1 17.654	54	0.147
55	0 9.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 7.988	1 17.817	55	0.150
56	0 9.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 8.152	1 17.981	56	0.153
57	0 9.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 8.315	1 18.145	57	0.156
58	0 9.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 8.479	1 18.309	58	0.158
59	0 9.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 8.643	1 18.473	59	0.161
Side-real.	$0^{h.}$	$1^{h.}$	$2^{h.}$	$3^{h.}$	$4^{h.}$	$5^{h.}$	$6^{h.}$	$7^{h.}$	For Seconds.	

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Side-real.	8^{h}.	9^{h}.	10^{h}.	11^{h}.	12^{h}.	13^{h}.	14^{h}.	15^{h}.	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 7.784	2 17.614	2 27.443	0	0.000
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 7.948	2 17.778	2 27.607	1	0.003
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 8.112	2 17.941	2 27.771	2	0.005
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 8.276	2 18.105	2 27.935	3	0.008
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 8.440	2 18.269	2 28.099	4	0.011
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 8.603	2 18.433	2 28.263	5	0.014
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 8.767	2 18.597	2 28.426	6	0.016
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 8.931	2 18.761	2 28.590	7	0.019
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 9.095	2 18.924	2 28.754	8	0.022
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 9.259	2 19.088	2 28.918	9	0.025
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 9.423	2 19.252	2 29.082	10	0.027
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 9.586	2 19.416	2 29.245	11	0.030
12	1 20.602	1 30.432	1 40,261	1 50.091	1 59.921	2 9.750	2 19.580	2 29.409	12	0.033
13	1 20.766	1 30.596	1 40.425	1 50.255	2 0.084	2 9.914	2 19.744	2 29.573	13	0.035
14	1 20.930	1 30.760	1 40.589	1 50.419	2 0.248	2 10.078	2 19.907	2 29.737	14	0.038
15	1 21.094	1 30.923	1 40.753	1 50.583	2 0.412	2 10.242	2 20.071	2 29.901	15	0.041
16	1 21.258	1 31.087	1 40.917	1 50.746	2 0.576	2 10.405	2 20.235	2 30.065	16	0.044
17	1 21.422	1 31.251	1 41.081	1 50.910	2 0.740	2 10.569	2 20.399	2 30.228	17	0.046
18	1 21.585	1 31.415	1 41.244	1 51.074	2 0.904	2 10.733	2 20.563	2 30.392	18	0.049
19	1 21.749	1 31.579	1 41.408	1 51.238	2 1.067	2 10.897	2 20.727	2 30.556	19	0.052
20	1 21.913	1 31.743	1 41.572	1 51.402	2 1.231	2 11.061	2 20.890	2 30.720	20	0.055
21	1 22.077	1 31.906	1 41.736	1 51.565	2 1.395	2 11.225	2 21.054	2 30.884	21	0.057
22	1 22.241	1 32.070	1 41.900	1 51.729	2 1.559	2 11.388	2 21.218	2 31.048	22	0.060
23	1 22.404	1 32.234	1 42.064	1 51.893	2 1.723	2 11.552	2 21.382	2 31.211	23	0.063
24	1 22.568	1 32.398	1 42.227	1 52.057	2 1.887	2 11.716	2 21.546	2 31.375	24	0.066
25	1 22.732	1 32.562	1 42.391	1 52.221	2 2.050	2 11.880	2 21.709	2 31.539	25	0.068
26	1 22.896	1 32.726	1 42.555	1 52.385	2 2.214	2 12.044	2 21.873	2 31.703	26	0.071
27	1 23.060	1 32.889	1 42.719	1 52.548	2 2.378	2 12.208	2 22,037	2 31.867	27	0.074
28	1 23.224	1 33.053	1 42.883	1 52.712	2 2.542	2 12.371	2 22.201	2 32.031	28	0.076
29	1 23.387	1 33.217	1 43.047	1 52.876	2 2.706	2 12.535	2 22.365	2 32.194	29	0.079
30	1 23.551	1 33.381	1 43.210	1 53.040	2 2.869	2 12.699	2 22.529	2 32.358	30	0.082
31	1 23.715	1 33.545	1 43.374	1 53.204	2 3.033	2 12.863	2 22.692	2 32.522	31	0.085
32	1 23.879	1 33.708	1 43.538	1 53.368	2 3.197	2 13.027	2 22.856	2 32.686	32	0.087
33	1 24.043	1 33.872	1 43.702	1 53.531	2 3.361	2 13.191	2 23.020	2 32.850	33	0.090
34	1 24.207	1 34.036	1 43.866	1 53.695	2 3.525	2 13.354	2 23.184	2 33.013	34	0.093
35	1 24.370	1 34.200	1 44.029	1 53.859	2 3.689	2 13.518	2 23.348	2 33.177	35	0.096
36	1 24.534	1 34.364	1 44.193	1 54.023	2 3.852	2 13.682	2 23.512	2 33.341	36	0.098
37	1 24.698	1 34.528	1 44.357	1 54.187	2 4.016	2 13.846	2 23.675	2 33.505	37	0.101
38	1 24.862	1 34.691	1 44.521	1 54.351	2 4.180	2 14.010	2 23.839	2 33.669	38	0.104
39	1 25.026	1 34.855	1 44.685	1 54.514	2 4.344	2 14.173	2 24.003	2 33.833	39	0.106
40	1 25.190	1 35.019	1 44.849	1 54.678	2 4.508	2 14.337	2 24.167	2 33.996	40	0.109
41	1 25.353	1 35.183	1 45.012	1 54.842	2 4.672	2 14.501	2 24.331	2 34.160	41	0.112
42	1 25.517	1 35.347	1 45.176	1 55.006	2 4.835	2 14.665	2 24.495	2 34.324	42	0.115
43	1 25.681	1 35.511	1 45.340	1 55.170	2 4.999	2 14.829	2 24.658	2 34.488	43	0.117
44	1 25.845	1 35.674	1 45.504	1 55.333	2 5.163	2 14.993	2 24.822	2 34.652	44	0.120
45	1 26.009	1 35.838	1 45.668	1 55.497	2 5.327	2 15.156	2 24.986	2 34.816	45	0.123
46	1 26.172	1 36.002	1 45.832	1 55.661	2 5.491	2 15.320	2 25.150	2 34.979	46	0.126
47	1 26.336	1 36.166	1 45.995	1 55.825	2 5.655	2 15.484	2 25.314	2 35.143	47	0.128
48	1 26.500	1 36.330	1 46.159	1 55.989	2 5.818	2 15.648	2 25.477	2 35.307	48	0.131
49	1 26.664	1 36.493	1 46.323	1 56.153	2 5.982	2 15.812	2 25.641	2 35.471	49	0.134
50	1 26.828	1 36.657	1 46.487	1 56.316	2 6.146	2 15.976	2 25.805	2 35.635	50	0.137
51	1 26.992	1 36.821	1 46.651	1 56.480	2 6.310	2 16.139	2 25.969	2 35.798	51	0.139
52	1 27.155	1 36.985	1 46.815	1 56.644	2 6.474	2 16.303	2 26.133	2 35.962	52	0.142
53	1 27.319	1 37.149	1 46.978	1 56.808	2 6.637	2 16.467	2 26.297	2 36.126	53	0.145
54	1 27.483	1 37.313	1 47.142	1 56.972	2 6.801	2 16.631	2 26.460	2 36.290	54	0.147
55	1 27.647	1 37.476	1 47.306	1 57.136	2 6.965	2 16.795	2 26.624	2 36.454	55	0.150
56	1 27.811	1 37.640	1 47.470	1 57.299	2 7.129	2 16.959	2 26.788	2 36.618	56	0.153
57	1 27.975	1 37.804	1 47.634	1 57.463	2 7.293	2 17.122	2 26.952	2 36.781	57	0.156
58	1 28.138	1 37.968	1 47.797	1 57.627	2 7.457	2 17.286	2 27.116	2 36.945	58	0.158
59	1 28.302	1 38.132	1 47.961	1 57.791	2 7.620	2 17.450	2 27.280	2 37.109	59	0.161
Side-real.	8^{h}.	9^{h}.	10^{h}.	11^{h}.	12^{h}.	13^{h}.	14^{h}.	15^{h}.	For Seconds.	

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Side-real.	$16^{\text{h.}}$	$17^{\text{h.}}$	$18^{\text{h.}}$	$19^{\text{h.}}$	$20^{\text{h.}}$	$21^{\text{h.}}$	$22^{\text{h.}}$	$23^{\text{h.}}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	0	0.000
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1	0.003
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2	0.005
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3	0.008
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4	0.011
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5	0.014
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6	0.016
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7	0.019
8	2 38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	8	0.022
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9	0.025
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10	0.027
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11	0.030
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12	0.033
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13	0.035
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14	0.038
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15	0.041
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16	0.044
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17	0.046
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18	0.049
19	2 40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19	0,052
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20	0.055
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21	0.057
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22	0.060
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23	0.063
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24	0.066
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25	0.068
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26	0.071
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27	0.074
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28	0.076
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29	0.079
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30	0.082
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	31	0.085
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32	0.087
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33	0.090
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34	0.093
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35	0.096
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36	0.098
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37	0.101
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38	0.104
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39	0.106
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40	0.109
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41	0.112
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42	0.115
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43	0.117
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44	0.120
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45	0.123
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46	0.126
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47	0.128
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	48	0.131
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49	0.134
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50	0.137
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	51	0.139
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52	0.142
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53	0.145
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54	0.147
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55	0.150
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56	0.153
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57	0.156
58	2 46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58	0.158
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59	0.161
Side-real.	$16^{\text{h.}}$	$17^{\text{h.}}$	$18^{\text{h.}}$	$19^{\text{h.}}$	$20^{\text{h.}}$	$21^{\text{h.}}$	$22^{\text{h.}}$	$23^{\text{h.}}$	For Seconds.	

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	0h.	1h.	2h.	3h.	4h.	5h.	6h.	7h.	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.856	0 19.713	0 29.569	0 39.426	0 49.282	0 59.139	1 8.995	0	0.000
1	0 0.164	0 10.021	0 19.877	0 29.734	0 39.590	0 49.447	0 59.303	1 9.160	1	0.003
2	0 0.329	0 10.185	0 20.041	0 29.898	0 39.754	0 49.611	0 59.467	1 9.324	2	0.005
3	0 0.493	0 10.349	0 20.206	0 30.062	0 39.919	0 49.775	0 59.632	1 9.488	3	0.008
4	0 0.657	0 10.514	0 20.370	0 30.227	0 40.083	0 49.939	0 59.796	1 9.652	4	0.011
5	0 0.821	0 10.678	0 20.534	0 30.391	0 40.247	0 50.104	0 59.960	1 9.817	5	0.014
6	0 0.986	0 10.842	0 20.699	0 30.555	0 40.412	0 50.268	1 0.124	1 9.981	6	0.016
7	0 1.150	0 11.006	0 20.863	0 30.719	0 40.576	0 50.432	1 0.289	1 10.145	7	0.019
8	0 1.314	0 11.171	0 21.027	0 30.884	0 40.740	0 50.597	1 0.453	1 10.310	8	0.022
9	0 1.478	0 11.335	0 21.191	0 31.048	0 40.904	0 50.761	1 0.617	1 10.474	9	0.025
10	0 1.643	0 11.499	0 21.356	0 31.212	0 41.069	0 50.925	1 0.782	1 10.638	10	0.027
11	0 1.807	0 11.663	0 21.520	0 31.376	0 41.233	0 51.089	1 0.946	1 10.802	11	0.030
12	0 1.971	0 11.828	0 21.684	0 31.541	0 41.397	0 51.254	1 1.110	1 10.967	12	0.033
13	0 2.136	0 11.992	0 21.849	0 31.705	0 41.561	0 51.418	1 1.274	1 11.131	13	0.036
14	0 2.300	0 12.156	0 22.013	0 31.869	0 41.726	0 51.582	1 1.439	1 11.295	14	0.038
15	0 2.464	0 12.321	0 22.177	0 32.034	0 41.890	0 51.746	1 1.603	1 11.459	15	0.041
16	0 2.628	0 12.485	0 22.341	0 32.198	0 42.054	0 51.911	1 1.767	1 11.624	16	0.044
17	0 2.793	0 12.649	0 22.506	0 32.362	0 42.219	0 52.075	1 1.932	1 11.788	17	0.047
18	0 2.957	0 12.813	0 22.670	0 32.526	0 42.383	0 52.239	1 2.096	1 11.952	18	0.049
19	0 3.121	0 12.978	0 22.834	0 32.691	0 42.547	0 52.404	1 2.260	1 12.117	19	0.052
20	0 3.285	0 13.142	0 22.998	0 32.855	0 42.711	0 52.568	1 2.424	1 12.281	20	0.055
21	0 3.450	0 13.306	0 23.163	0 33.019	0 42.876	0 52.732	1 2.589	1 12.445	21	0.057
22	0 3.614	0 13.471	0 23.327	0 33.183	0 43.040	0 52.896	1 2.753	1 12.609	22	0.060
23	0 3.778	0 13.635	0 23.491	0 33.348	0 43.204	0 53.061	1 2.917	1 12.774	23	0.063
24	0 3.943	0 13.799	0 23.656	0 33.512	0 43.368	0 53.225	1 3.081	1 12.938	24	0.066
25	0 4.107	0 13.963	0 23.820	0 33.676	0 43.533	0 53.389	1 3.246	1 13.102	25	0.068
26	0 4.271	0 14.128	0 23.984	0 33.841	0 43.697	0 53.554	1 3.410	1 13.266	26	0.071
27	0 4.435	0 14.292	0 24.148	0 34.005	0 43.861	0 53.718	1 3.574	1 13.431	27	0.074
28	0 4.600	0 14.456	0 24.313	0 34.169	0 44.026	0 53.882	1 3.739	1 13.595	28	0.077
29	0 4.764	0 14.620	0 24.477	0 34.333	0 44.190	0 54.046	1 3.903	1 13.759	29	0.079
30	0 4.928	0 14.785	0 24.641	0 34.498	0 44.354	0 54.211	1 4.067	1 13.924	30	0.082
31	0 5.093	0 14.949	0 24.805	0 34.662	0 44.518	0 54.375	1 4.231	1 14.088	31	0.085
32	0 5.257	0 15.113	0 24.970	0 34.826	0 44.683	0 54.539	1 4.396	1 14.252	32	0.088
33	0 5.421	0 15.278	0 25.134	0 34.990	0 44.847	0 54.703	1 4.560	1 14.416	33	0.090
34	0 5.585	0 15.442	0 25.298	0 35.155	0 45.011	0 54.868	1 4.724	1 14.581	34	0.093
35	0 5.750	0 15.606	0 25.463	0 35.319	0 45.176	0 55.032	1 4.888	1 14.745	35	0.096
36	0 5.914	0 15.770	0 25.627	0 35.483	0 45.340	0 55.196	1 5.053	1 14.909	36	0.099
37	0 6.078	0 15.935	0 25.791	0 35.648	0 45.504	0 55.361	1 5.217	1 15.073	37	0.101
38	0 6.242	0 16.099	0 25.955	0 35.812	0 45.668	0 55.525	1 5.381	1 15.238	38	0.104
39	0 6.407	0 16.263	0 26.120	0 35.976	0 45.833	0 55.689	1 5.546	1 15.402	39	0.107
40	0 6.571	0 16.427	0 26.284	0 36.140	0 45.997	0 55.853	1 5.710	1 15.566	40	0.110
41	0 6.735	0 16.592	0 26.448	0 36.305	0 46.161	0 56.018	1 5.874	1 15.731	41	0.112
42	0 6.900	0 16.756	0 26.612	0 36.469	0 46.325	0 56.182	1 6.038	1 15.895	42	0.115
43	0 7.064	0 16.920	0 26.777	0 36.633	0 46.490	0 56.346	1 6.203	1 16.059	43	0.118
44	0 7.228	0 17.085	0 26.941	0 36.798	0 46.654	0 56.510	1 6.367	1 16.223	44	0.120
45	0 7.392	0 17.249	0 27.105	0 36.962	0 46.818	0 56.675	1 6.531	1 16.388	45	0.123
46	0 7.557	0 17.413	0 27.270	0 37.126	0 46.983	0 56.839	1 6.695	1 16.552	46	0.126
47	0 7.721	0 17.577	0 27.434	0 37.290	0 47.147	0 57.003	1 6.860	1 16.716	47	0.129
48	0 7.885	0 17.742	0 27.598	0 37.455	0 47.311	0 57.168	1 7.024	1 16.881	48	0.131
49	0 8.049	0 17.906	0 27.762	0 37.619	0 47.475	0 57.332	1 7.188	1 17.045	49	0.134
50	0 8.214	0 18.070	0 27.927	0 37.783	0 47.640	0 57.496	1 7.353	1 17.209	50	0.137
51	0 8.378	0 18.234	0 28.091	0 37.947	0 47.804	0 57.660	1 7.517	1 17.373	51	0.140
52	0 8.542	0 18.399	0 28.255	0 38.112	0 47.968	0 57.825	1 7.681	1 17.538	52	0.142
53	0 8.707	0 18.563	0 28.420	0 38.276	0 48.132	0 57.989	1 7.845	1 17.702	53	0.145
54	0 8.871	0 18.727	0 28.584	0 38.440	0 48.297	0 58.153	1 8.010	1 17.866	54	0.148
55	0 9.035	0 18.892	0 28.748	0 38.605	0 48.461	0 58.317	1 8.174	1 18.030	55	0.151
56	0 9.199	0 19.056	0 28.912	0 38.769	0 48.625	0 58.482	1 8.338	1 18.195	56	0.153
57	0 9.364	0 19.220	0 29.077	0 38.933	0 48.790	0 58.646	1 8.502	1 18.359	57	0.156
58	0 9.528	0 19.384	0 29.241	0 39.097	0 48.954	0 58.810	1 8.667	1 18.523	58	0.159
59	0 9.692	0 19.549	0 29.405	0 39.262	0 49.118	0 58.975	1 8.831	1 18.688	59	0.162
Mean Solar.	0h.	1h.	2h.	3h.	4h.	5h.	6h.	7h.	For Seconds.	

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	8h.	9h.	10h.	11h.	12h.	13h.	14h.	15h.	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.852	1 28.708	1 38.565	1 48.421	1 58.278	2 8.134	2 17.991	2 27.847	0	0.000
1	1 19.016	1 28.873	1 38.729	1 48.585	1 58.442	2 8.298	2 18.155	2 28.011	1	0.003
2	1 19.180	1 29.037	1 38.893	1 48.750	1 58.606	2 8.463	2 18.319	2 28.176	2	0.005
3	1 19.345	1 29.201	1 39.058	1 48.914	1 58.771	2 8.627	2 18.483	2 28.340	3	0.008
4	1 19.509	1 29.365	1 39.222	1 49.078	1 58.935	2 8.791	2 18.648	2 28.504	4	0.011
5	1 19.673	1 29.530	1 39.386	1 49.243	1 59.099	2 8.956	2 18.812	2 28.668	5	0.014
6	1 19.837	1 29.694	1 39.550	1 49.407	1 59.263	2 9.120	2 18.976	2 28.833	6	0.016
7	1 20.002	1 29.858	1 39.715	1 49.571	1 59.428	2 9.284	2 19.141	2 28.997	7	0.019
8	1 20.166	1 30.022	1 39.879	1 49.735	1 59.592	2 9.448	2 19.305	2 29.161	8	0.022
9	1 20.330	1 30.187	1 40.043	1 49.900	1 59.756	2 9.613	2 19.469	2 29.326	9	0.025
10	1 20.495	1 30.351	1 40.207	1 50.064	1 59.920	2 9.777	2 19.633	2 29.490	10	0.027
11	1 20.659	1 30.515	1 40.372	1 50.228	2 0.085	2 9.941	2 19.798	2 29.654	11	0.030
12	1 20.823	1 30.680	1 40.536	1 50.393	2 0.249	2 10.105	2 19.962	2 29.818	12	0.033
13	1 20.987	1 30.844	1 40.700	1 50.557	2 0.413	2 10.270	2 20.126	2 29.983	13	0.036
14	1 21.152	1 31.008	1 40.865	1 50.721	2 0.578	2 10.434	2 20.290	2 30.147	14	0.038
15	1 21.316	1 31.172	1 41.029	1 50.885	2 0.742	2 10.598	2 20.455	2 30.311	15	0.041
16	1 21.480	1 31.337	1 41.193	1 51.050	2 0.906	2 10.763	2 20.619	2 30.476	16	0.044
17	1 21.644	1 31.501	1 41.357	1 51.214	2 1.070	2 10.927	2 20.783	2 30.640	17	0.047
18	1 21.809	1 31.665	1 41.522	1 51.378	2 1.235	2 11.091	2 20.948	2 30.804	18	0.049
19	1 21.973	1 31.829	1 41.686	1 51.542	2 1.399	2 11.255	2 21.112	2 30.968	19	0.052
20	1 22.137	1 31.994	1 41.850	1 51.707	2 1.563	2 11.420	2 21.276	2 31.133	20	0.055
21	1 22.302	1 32.158	1 42.015	1 51.871	2 1.727	2 11.584	2 21.440	2 31.297	21	0.057
22	1 22.466	1 32.322	1 42.179	1 52.035	2 1.892	2 11.748	2 21.605	2 31.461	22	0.060
23	1 22.630	1 32.487	1 42.343	1 52.200	2 2.056	2 11.912	2 21.769	2 31.625	23	0.063
24	1 22.794	1 32.651	1 42.507	1 52.364	2 2.220	2 12.077	2 21.933	2 31.790	24	0.066
25	1 22.959	1 32.815	1 42.672	1 52.528	2 2.385	2 12.241	2 22.098	2 31.954	25	0.068
26	1 23.123	1 32.979	1 42.836	1 52.692	2 2.549	2 12.405	2 22.262	2 32.118	26	0.071
27	1 23.287	1 33.144	1 43.000	1 52.857	2 2.713	2 12.570	2 22.426	2 32.283	27	0.074
28	1 23.451	1 33.308	1 43.164	1 53.021	2 2.877	2 12.734	2 22.590	2 32.447	28	0.077
29	1 23.616	1 33.472	1 43.329	1 53.185	2 3.042	2 12.898	2 22.755	2 32.611	29	0.079
30	1 23.780	1 33.637	1 43.493	1 53.349	2 3.206	2 13.062	2 22.919	2 32.775	30	0.082
31	1 23.944	1 33.801	1 43.657	1 53.514	2 3.370	2 13.227	2 23.083	2 32.940	31	0.085
32	1 24.109	1 33.965	1 43.822	1 53.678	2 3.534	2 13.391	2 23.247	2 33.104	32	0.088
33	1 24.273	1 34.129	1 43.986	1 53.842	2 3.699	2 13.555	2 23.412	2 33.268	33	0.090
34	1 24.437	1 34.294	1 44.150	1 54.007	2 3.863	2 13.720	2 23.576	2 33.432	34	0.093
35	1 24.601	1 34.458	1 44.314	1 54.171	2 4.027	2 13.884	2 23.740	2 33.597	35	0.096
36	1 24.766	1 34.622	1 44.479	1 54.335	2 4.192	2 14.048	2 23.905	2 33.761	36	0.099
37	1 24.930	1 34.786	1 44.643	1 54.499	2 4.356	2 14.212	2 24.069	2 33.925	37	0.101
38	1 25.094	1 34.951	1 44.807	1 54.664	2 4.520	2 14.377	2 24.233	2 34.090	38	0.104
39	1 25.259	1 35.115	1 44.971	1 54.828	2 4.684	2 14.541	2 24.397	2 34.254	39	0.107
40	1 25.423	1 35.279	1 45.136	1 54.992	2 4.849	2 14.705	2 24.562	2 34.418	40	0.110
41	1 25.587	1 35.444	1 45.300	1 55.156	2 5.013	2 14.869	2 24.726	2 34.582	41	0.112
42	1 25.751	1 35.608	1 45.464	1 55.321	2 5.177	2 15.034	2 24.890	2 34.747	42	0.115
43	1 25.916	1 35.772	1 45.629	1 55.485	2 5.342	2 15.198	2 25.054	2 34.911	43	0.118
44	1 26.080	1 35.936	1 45.793	1 55.649	2 5.506	2 15.362	2 25.219	2 35.075	44	0.120
45	1 26.244	1 36.101	1 45.957	1 55.814	2 5.670	2 15.527	2 25.383	2 35.239	45	0.123
46	1 26.408	1 36.265	1 46.121	1 55.978	2 5.834	2 15.691	2 25.547	2 35.404	46	0.126
47	1 26.573	1 36.429	1 46.286	1 56.142	2 5.999	2 15.855	2 25.712	2 35.568	47	0.129
48	1 26.737	1 36.593	1 46.450	1 56.306	2 6.163	2 16.019	2 25.876	2 35.732	48	0.131
49	1 26.901	1 36.758	1 46.614	1 56.471	2 6.327	2 16.184	2 26.040	2 35.897	49	0.134
50	1 27.066	1 36.922	1 46.778	1 56.635	2 6.491	2 16.348	2 26.204	2 36.061	50	0.137
51	1 27.230	1 37.086	1 46.943	1 56.799	2 6.656	2 16.512	2 26.369	2 36.225	51	0.140
52	1 27.394	1 37.251	1 47.107	1 56.964	2 6.820	2 16.676	2 26.533	2 36.389	52	0.142
53	1 27.558	1 37.415	1 47.271	1 57.128	2 6.984	2 16.841	2 26.697	2 36.554	53	0.145
54	1 27.723	1 37.579	1 47.436	1 57.292	2 7.149	2 17.005	2 26.861	2 36.718	54	0.148
55	1 27.887	1 37.743	1 47.600	1 57.456	2 7.313	2 17.169	2 27.026	2 36.882	55	0.151
56	1 28.051	1 37.908	1 47.764	1 57.621	2 7.477	2 17.334	2 27.190	2 37.047	56	0.153
57	1 28.215	1 38.072	1 47.928	1 57.785	2 7.641	2 17.498	2 27.354	2 37.211	57	0.156
58	1 28.380	1 38.236	1 48.093	1 57.949	2 7.806	2 17.662	2 27.519	2 37.375	58	0.159
59	1 28.544	1 38.400	1 48.257	1 58.113	2 7.970	2 17.826	2 27.683	2 37.539	59	0.162
Mean Solar.	8h.	9h.	10h.	11h.	12h.	13h.	14h.	15h.	For Seconds.	

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	$16^{\text{h.}}$	$17^{\text{h.}}$	$18^{\text{h.}}$	$19^{\text{h.}}$	$20^{\text{h.}}$	$21^{\text{h.}}$	$22^{\text{h.}}$	$23^{\text{h.}}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.704	2 47.560	2 57.417	3 7.273	3 17.129	3 26.986	3 36.842	3 46.699	0	0.000
1	2 37.868	2 47.724	2 57.581	3 7.437	3 17.294	3 27.150	3 37.007	3 46.863	1	0.003
2	2 38.032	2 47.889	2 57.745	3 7.602	3 17.458	3 27.315	3 37.171	3 47.027	2	0.005
3	2 38.196	2 48.053	2 57.909	3 7.766	3 17.622	3 27.479	3 37.335	3 47.192	3	0.008
4	2 38.361	2 48.217	2 58.074	3 7.930	3 17.787	3 27.643	3 37.500	3 47.356	4	0.011
5	2 38.525	2 48.381	2 58.238	3 8.094	3 17.951	3 27.807	3 37.664	3 47.520	5	0.014
6	2 38.689	2 48.546	2 58.402	3 8.259	3 18.115	3 27.972	3 37.828	3 47.685	6	0.016
7	2 38.854	2 48.710	2 58.566	3 8.423	3 18.279	3 28.136	3 37.992	3 47.849	7	0.019
8	2 39.018	2 48.874	2 58.731	3 8.587	3 18.444	3 28.300	3 38.157	3 48.013	8	0.022
9	2 39.182	2 49.039	2 58.895	3 8.751	3 18.608	3 28.464	3 38.321	3 48.177	9	0.025
10	2 39.346	2 49.203	2 59.059	3 8.916	3 18.772	3 28.629	3 38.485	3 48.342	10	0.027
11	2 39.511	2 49.367	2 59.224	3 9.080	3 18.937	3 28.793	3 38.649	3 48.506	11	0.030
12	2 39.675	2 49.531	2 59.388	3 9.244	3 19.101	3 28.957	3 38.814	3 48.670	12	0.033
13	2 39.839	2 49.696	2 59.552	3 9.409	3 19.265	3 29.122	3 38.978	3 48.834	13	0.036
14	2 40.003	2 49.860	2 59.716	3 9.573	3 19.429	3 29.286	3 39.142	3 48.999	14	0.038
15	2 40.168	2 50.024	2 59.881	3 9.737	3 19.594	3 29.450	3 39.307	3 49.163	15	0.041
16	2 40.332	2 50.188	3 0.045	3 9.901	3 19.758	3 29.614	3 39.471	3 49.327	16	0.044
17	2 40.496	2 50.353	3 0.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	17	0.047
18	2 40.661	2 50.517	3 0.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	18	0.049
19	2 40.825	2 50.681	3 0.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	19	0.052
20	2 40.989	2 50.846	3 0.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	20	0.055
21	2 41.153	2 51.010	3 0.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	21	0.057
22	2 41.318	2 51.174	3 1.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	22	0.060
23	2 41.482	2 51.338	3 1.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	23	0.063
24	2 41.646	2 51.503	3 1.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	24	0.066
25	2 41.810	2 51.667	3 1.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25	0.068
26	2 41.975	2 51.831	3 1.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	26	0.071
27	2 42.139	2 51.995	3 1.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	27	0.074
28	2 42.303	2 52.160	3 2.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	28	0.077
29	2 42.468	2 52.324	3 2.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	29	0.079
30	2 42.632	2 52.488	3 2.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30	0.082
31	2 42.796	2 52.653	3 2.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	31	0.085
32	2 42.960	2 52.817	3 2.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	32	0.088
33	2 43.125	2 52.981	3 2.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	33	0.090
34	2 43.289	2 53.145	3 3.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	34	0.093
35	2 43.453	2 53.310	3 3.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	35	0.096
36	2 43.617	2 53.474	3 3.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	36	0.099
37	2 43.782	2 53.638	3 3.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	37	0.101
38	2 43.946	2 53.803	3 3.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	38	0.104
39	2 44.110	2 53.967	3 3.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	39	0.107
40	2 44.275	2 54.131	3 3.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40	0.110
41	2 44.439	2 54.295	3 4.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	41	0.112
42	2 44.603	2 54.460	3 4.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	42	0.115
43	2 44.767	2 54.624	3 4.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	43	0.118
44	2 44.932	2 54.788	3 4.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	44	0.120
45	2 45.096	2 54.952	3 4.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45	0.123
46	2 45.260	2 55.117	3 4.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	46	0.126
47	2 45.425	2 55.281	3 5.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	47	0.129
48	2 45.589	2 55.445	3 5.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	48	0.131
49	2 45.753	2 55.610	3 5.466	3 15.322	3 25.179	3 35.036	3 44.892	3 54.748	49	0.134
50	2 45.917	2 55.774	3 5.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50	0.137
51	2 46.082	2 55.938	3 5.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	51	0.140
52	2 46.246	2 56.102	3 5.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	52	0.142
53	2 46.410	2 56.267	3 6.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	53	0.145
54	2 46.574	2 56.431	3 6.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	54	0.148
55	2 46.739	2 56.595	3 6.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55	0.151
56	2 46.903	2 56.759	3 6.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	56	0.153
57	2 47.067	2 56.924	3 6.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	57	0.156
58	2 47.232	2 57.088	3 6.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	58	0.159
59	2 47.396	2 57.252	3 7.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	59	0.162
Mean Solar	$16^{\text{h.}}$	$17^{\text{h.}}$	$18^{\text{h.}}$	$19^{\text{h.}}$	$20^{\text{h.}}$	$21^{\text{h.}}$	$22^{\text{h.}}$	$23^{\text{h.}}$	For Seconds.	

TABLE IV.—LATITUDE BY POLARIS.

TABLE FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS.

Reduce the observed altitude of Polaris to the true altitude.

Reduce the recorded time of observation to local sidereal time.

If the sidereal time is
- less than $1^h\,18^m$, subtract it from $1^h\,18^m$;
- between $1^h\,18^m$ and $13^h\,18^m$, subtract $1^h\,18^m$ from it;
- greater than $13^h\,18^m$, subtract it from $25^h\,18^m$;

and the remainder is the hour-angle of Polaris.

With this hour-angle take out the correction from Table IV, and add it to or subtract it from the true altitude, according to its sign. The result is the latitude of the place.

Example.—1887, November 10, at $9^h\,29^m\,29^s$, P. M., mean solar time, in longitude 29° east of Greenwich, suppose the true altitude of Polaris to be 29° 29′: required the latitude of the place.

	h m s
Local astronomical mean time	9 29 29
Reduction from Table III, for $9^h\,29^m\,29^s$	+ 1 34
Greenwich sidereal time of mean noon, November 10, page 183 .	15 17 18.5
Reduction from Table III, for longitude (= $1^h\,56^m$ east, or minus)	— 0 19
Sum (having regard to signs) is equal to local sidereal time .	0 48 2.5
	h m s 1 18 0
Subtract sidereal time	0 48 2.5
Remainder is equal to hour-angle of Polaris	0 29 57.5

	° ′
True altitude	+29 29.0
Correction from Table IV. . . .	— 1 17.2
Latitude	+28 11.8

TABLE IV—1887.

Hour-Angle.	0h.		1h.		2h.		3h.		4h.		5h.	
m	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′
0	−1 17.9	0.0	−1 15.2	0.4	−1 7.5	0.9	−0 55.1	1.2	−0 38.9	1.4	−0 20.2	1.7
5	1 17.9	+0.1	1 14.8	0.5	1 6.6	0.9	0 53.9	1.3	0 37.5	1.5	0 18.5	1.6
10	1 17.8	0.1	1 14.3	0.5	1 5.7	0.9	0 52.6	1.2	0 36.0	1.6	0 16.9	1.7
15	1 17.7	0.1	1 13.8	0.6	1 4.8	1.0	0 51.4	1.3	0 34.4	1.5	0 15.2	1.7
20	−1 17.6	0.2	−1 13.2	0.6	−1 3.8	1.0	−0 50.1	1.3	−0 32.9	1.5	−0 13.5	1.7
25	1 17.4	0.2	1 12.6	0.6	1 2.8	1.0	0 48.8	1.4	0 31.4	1.6	0 11.8	1.6
30	1 17.2	0.2	1 12.0	0.7	1 1.8	1.1	0 47.4	1.3	0 29.8	1.6	0 10.2	1.7
35	1 17.0	0.3	1 11.3	0.7	1 0.7	1.0	0 46.1	1.4	0 28.2	1.6	0 8.5	1.7
40	−1 16.7	0.3	−1 10.6	0.7	−0 59.7	1.1	−0 44.7	1.4	−0 26.6	1.6	−0 6.8	1.7
45	1 16.4	0.3	1 9.9	0.8	0 58.6	1.2	0 43.3	1.4	0 25.0	1.6	0 5.1	1.7
50	1 16.1	0.4	1 9.1	0.8	0 57.4	1.1	0 41.9	1.5	0 23.4	1.6	0 3.4	1.7
55	1 15.7	0.5	1 8.3	0.8	0 56.3	1.2	0 40.4	1.5	0 21.8	1.6	−0 1.7	1.7
60	−1 15.2		−1 7.5		−0 55.1		−0 38.9		−0 20.2		+0 0.01	

Hour-Angle.	6h.		7h.		8h.		9h.		10h.		11h.	
m	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′
0	+0 0.01	1.7	+0 20.2	1.6	+0 38.9	1.5	+0 55.1	1.2	+1 7.5	0.8	+1 15.2	0.5
5	0 1.7	1.7	0 21.8	1.6	0 40.4	1.5	0 56.3	1.1	1 8.3	0.8	1 15.7	0.4
10	0 3.4	1.7	0 23.4	1.6	0 41.9	1.4	0 57.4	1.2	1 9.1	0.8	1 16.1	0.3
15	0 5.1	1.7	0 25.0	1.6	0 43.3	1.4	0 58.6	1.1	1 9.9	0.7	1 16.4	0.3
20	+0 6.8	1.7	+0 26.6	1.6	+0 44.7	1.4	+0 59.7	1.1	+1 10.6	0.7	+1 16.7	0.3
25	0 8.5	1.7	0 28.2	1.6	0 46.1	1.3	1 0.8	1.0	1 11.3	0.7	1 17.0	0.2
30	0 10.2	1.7	0 29.8	1.6	0 47.4	1.4	1 1.8	1.0	1 12.0	0.6	1 17.2	0.2
35	0 11.9	1.6	0 31.4	1.5	0 48.8	1.3	1 2.8	1.0	1 12.6	0.6	1 17.4	0.2
40	+0 13.5	1.7	+0 32.9	1.5	+0 50.1	1.3	+1 3.8	1.0	+1 13.2	0.6	+1 17.6	0.1
45	0 15.2	1.7	0 34.4	1.6	0 51.4	1.2	1 4.8	0.9	1 13.8	0.5	1 17.7	0.1
50	0 16.9	1.6	0 36.0	1.5	0 52.6	1.3	1 5.7	0.9	1 14.3	0.5	1 17.8	0.1
55	0 18.5	1.7	0 37.5	1.4	0 53.9	1.2	1 6.6	0.9	1 14.8	0.4	1 17.9	0.0
60	+0 20.2		+0 38.9		+0 55.1		+1 7.5		+1 15.2		+1 17.9	

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